TESTING BUFFERS AND COUPLINGS

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MODERN TRANSPORT

"THE TIMES" OF THE TRANSPORT WORLD

ROAD VEHICLE ENGINE FUMES

See Page 12

VOL. LXXX No. 2073 [*Registered at the G.P.O. as a newspaper*] LONDON, DECEMBER 20, 1958 PRICE NINEPENCE

CURRENT TOPICS

Improvements in Distribution

ONE of the most remarkable benefits conferred by the motor vehicle is the improvement in distribution facilities which it makes possible as compared with the radius of action available to the horse and cart. In part the present troubles of the railways can be attributed to a late realisation that there is no longer scope for closely spaced wayside stations. One group engaged in nationwide distribution of its products has, by modifying its depot pattern to suit the capacity of the modern lorry, reduced their numbers from over 400 to round about 100, with a further reduction envisaged as the programme comes to its final stages. S. P. D., Limited, the warehousing and distributing associate of Unilever, Limited, has similarly modernised its arrangements throughout the United Kingdom, although here the desirability of additional buffer depots in wartime obscures the rationalisation which had taken place before 1939. The twenty-second of the postwar programme of new logically-placed depots was opened last week at Glaisdale Drive East, in the western suburbs of Nottingham, by Mr. Ernest Whitaker, transport adviser of Unilever, Limited. He said that S.P.D. delivered nearly one million tons a year on behalf of 17 Unilever companies to wholesalers and retailers, the total number of outlets being of the order of 150,000. There were eight million deliveries made up of many millions of packages, from a range of 650 packs, covering margarine, cooking fats, toilet preparations, foods and frozen foods. The depot system was the Unilever treatment of the local phase of mass distribution. It provided the advantages of bulk handling and bulk movement from factories to local centres, with a high standard of customer service; it brought together the products of different factories for composite delivery; it permitted factories to conserve accommodation and labour for the prime purpose of production; it covered seasonal and other fluctuations in production and sale; and it made available for the group's marketing companies a variety of specialised storage, distributive and ancillary services in all parts of the country. Particularly to be remarked, in our view, is the development of palletisation, of which the Unilever group has been an advocate, and the increased size of the cold store compared with earlier depots, to cope with public demand for frozen foods. A description of the depot will appear subsequently.

B.T.C. Staff Census

PUBLICATION by the British Transport Commission of its *Annual Census of Staff* (additional copies 1s. from the Publicity Officer, B.T.C., 222 Marylebone Road, London, N.W.1) discloses that a new method has been adopted which results in the actual number of staff being reflected instead of the former equated basis. In consequence the figures now accord with statistics otherwise published by the Commission. The effect of the change in method was tested in a sample representing nearly one-third of the British Railways staff. The comparison showed that the overall adult average earnings figures were substantially the same but, as might have been expected, there were variations from grade to grade. Under the new method men turned out to have overall average earnings 0.3 per cent higher while those of women were 0.5 per cent lower. Whereas juniors working in adult posts were treated as adults, the new method includes them entirely on an age basis and this redefinition also has an effect. The usefulness of the figures set out in the pamphlet would, we feel, be enhanced by the provision of some basis of comparison with the previous year. Apart from officers, the B.R. staff totalled 568,212 at March 22 last. Sample figures are provided to show the effect of the wage increases from June 30, 1958, and these indicate that the average earnings of porters rose from £9 15s. to £10 1s., those of engine drivers from £13 17s. to £14 6s. and those of class 4 signalmen from £10 14s. to £11.

Energetic Search for Traffic

THE chairman of Silver City Airways, Mr. Eoin C. Mekie, is a past master at establishing firmly the idea that his company thrives despite the difficulties it meets, rather than waxing fat without much effort. It would indeed be an unusual airline if the latter was the case. Announcing the off-peak reductions in car ferry rates, recorded in MODERN TRANSPORT of December 13, he pointed out that only in four months of the year did Silver City earn its operating costs, quite apart from such things as overheads. It was for that very reason that further endeavours were being made to attract traffic during the slacker periods. These were aimed particularly at owners of small- and medium-sized family cars who represented the largest potential source of tourists by road in Europe. Looking further ahead, he felt that the airline must welcome every road improvement and development scheme since he was convinced that stories of traffic congestion in Britain did much to deter foreign visitors from bringing cars with them. This seemed the only explanation for carrying only one car registered in Europe for every nine registered in Britain. We should have thought the meagre foreign travel allowance available to some European citizens had something to do with it. The growth of the Roadair freight service to the Continent had been particularly satisfactory and it was contributing increasingly to the improvement of the off-peak situation.

LEADING FEATURES IN THIS ISSUE

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A Tunnel Strengthening Job

AFTER a decade of wrangling about the extension of the London and South Western Railway westward to Exeter, the section on from Salisbury was being tackled a century ago by the Salisbury and Yeovil Railway, in which the L.S.W.R. was interested and which, indeed, it obtained powers to lease in 1858. But the minor company, which after Parliamentary battling was authorised to build a single line over its 40-mile route in 1854, was by then decidedly impecunious and had only £4 2s. 4d. in the bank on April 3, 1856, when Miss Seymour cut the first sod at Gillingham, Dorset. Various deviations were sought in search of the cheapest line and, despite the difficult broken country through which it runs, it was laid with as little earthworks as possible and with heavy gradients of up to 1 in 80 in switchback formation. A typical section falls from the summit at Semley down 1 in 100, easing to 1 in 130, towards Gillingham, whence there is a climb at 1 in 300 and 1 in 100 to a summit at milepost 107½, where the gradient changes to 1 in 100 down through Gillingham Tunnel; after steepening to 1 in 90 there is a mile of level before the climb begins at 1 in 80 and 100 through Templecombe. Gillingham, or as it was originally called, Buckhorn Weston, Tunnel was built in brick under the Sandley estate through a silty clay called by the contractors "blue bind." Towards the west portal the strata of Oxford clays become fine grained and bands of sandstone rock and sand discharge much water into the tunnel. Even during construction heavy swelling pressures were imposed, requiring very strong timbering; a brick invert was provided towards the Templecombe mouth to strengthen the tunnel footings. The tunnel was completed in 1859, and the railway, which had reached Gillingham on May 1, 1859, was projected to Sherborne on May 7, 1860, and to Yeovil on June 1. By the L.S.W. company's own line the throughout route to Exeter became available on July 18, 1860. Over a period of years the brickwork of the tunnel, especially at the western end, has been subject to deformation and the invert has been severely damaged by pressure from the clay, while permanent way conditions have been difficult. In 1958 therefore, it was decided to provide a mass concrete invert with old rail reinforcement through the western half of the tunnel and to continue it on a modified scale to the eastern portal. This work, which necessitates single-line possessions continuously through the winter, is now making good progress. When it is completed, movement of the tunnel lining should have been arrested and it will be possible to lower the rail level to give clearance for overhead electrification. By courtesy of the chief civil engineer of the Southern Region we have recently been enabled to inspect the work and a description will appear shortly in our pages.

Disappointments for C.I.E.

THE report of Coras Iompair Eireann for the year ended March 31, 1958, does not make particularly cheerful reading. The railway receipts show passenger train traffic virtually unchanged at £2,798,174 (£2,795,631) but goods train receipts fell from £3,915,442 to £3,739,050. The increase of some 131,000 in second-class passengers was largely offset in terms of revenue by a decline of more than 15,000 in the first-class travellers. This the report attributes partly to the increased comfort provided in the second class, partly to the increasing number of cars and partly to the steady expansion of self-drive car hire organisations. So far as bus and coach services were concerned traffic on the city services provided in Cork, Galway, Limerick and Waterford increased by nearly 690,000 passengers, but there were 2,520,000 fewer riders on the Dublin services. Provincial bus services and tours and private hire operations carried more passengers, but the former earned less per passenger. The profit and loss account for the whole undertaking shows that while the road passenger, road freight, and hotels, refreshment rooms and restaurant car sections again made profits, these were less than in the previous period, save for the last section, and the road passenger profits declined by close on £250,000. The reduction from £1,013,667 to £970,185 in the loss on railway working was felt to be disappointing since expenditure decreased by nearly £277,000 compared with 1956-57, before providing for depreciation, which was £60,000 higher. The saving of £300,000 on fuel was attributable largely to the introduction of more diesel units.

Cross-checking of Block Registers

AT about 9.25 p.m. on Saturday, March 8 last, the 5.15 p.m. Luton—Manchester Central express excursion train was wrongly admitted under clear signals on the down fast line into Chinley Station (London Midland Region) where it ran into the 7.10 p.m. Derby—Manchester Central passenger train, which was standing at the platform. The latter's rear coach was penetrated and eight passengers were slightly injured. In his report on the accident Colonel W. P. Reed, an Inspecting Officer of Railways, exonerates the driver of the excursion train, who was fully alert and lost no time in applying his brake, and attributes responsibility to the signalman on duty in Chinley South Box for failing to reverse the relevant points before accepting the second train; this signalman admitted that he generally gave "line clear" on occasions such as this before setting the points for the loop. Both he and another signalman in fact confessed that they had been accustomed to working without due regard to the regulations. It was clear that their shortcomings in certain respects had been brought to light in the past, and the Inspecting Officer expresses surprise that the district signalmen's inspectors had not kept a closer check on their work. This they could have done, he says, by comparing the register of each box for the signalman concerned with those of the boxes on either side; such a comparison, made at his request for the week previous to the accident, showed a considerable number of discrepancies. The Commission indeed had already drawn attention, following previous representations by the Ministry's inspectorate, to the importance of the cross-checking of registers as a means of supervising the work of signalmen. The report states that instructions have now been issued in the L.M. Region for a twice-yearly cross-check of block registers.

Looking to the Future

DESPITE allegations to the contrary, the airlines of the world are for ever seeking means of reducing future costs, while simultaneously maintaining or, if possible, increasing their high level of efficiency. Many of these efforts are little publicised because they deal with matters of internal organisation. One example is the Jet Overhaul Conference comprising 14 airlines in Europe and the Commonwealth which are or will be overhauling jet engines and already, in many cases, overhaul gas turbines. The original idea, which emanated from K.L.M. (Royal Dutch Airlines), embraced a form of common purchase of overhaul equipment but, although this proved impracticable, the value of free discussion of mutual problems in private conclave was so apparent that it was decided to establish the conference on a regular basis with meetings as circumstances demanded. These take place as a rule every three or four months; the eighth has been held in London this week with British European Airways as host. Starting on Monday afternoon with a visit to the corporation's engineering base at London Airport, there followed two days in which four papers were presented and discussed and three sessions devoted to 21 questions raised by operators. Thereafter came a journey to Derby and a visit to the Rolls-Royce engine works. A valuable feature was the attendance of manufacturers' representatives.

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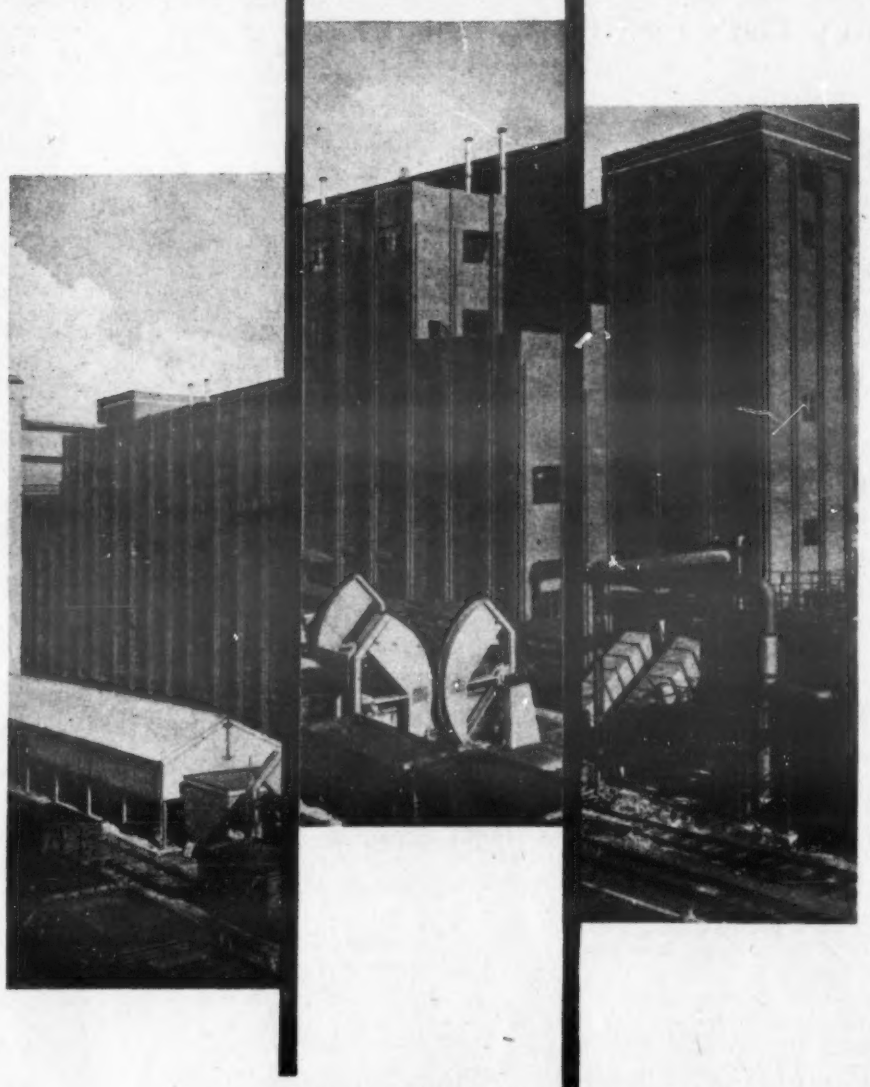

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The Editor is prepared to consider contributions offered for publication in MODERN TRANSPORT, but intending contributors should first study the length and style of articles appearing in the paper and satisfy themselves that the topic with which they propose to deal is relevant to editorial requirements. In controversial subjects relating to all aspects of transport and traffic this newspaper offers a platform for independent comment and debate, its object being to encourage the provision of all forms of transport in the best interests of the community.

We desire to call the attention of our readers to the fact that Russell Court, 3-16 Woburn Place, London, W.C.1, is our sole London address, and that no connection exists between this newspaper and any other publications bearing somewhat similar titles.

★

The Transport Debate

THE debate in the House of Commons last week on the second reading of the Transport (Borrowing Powers) Bill surpassed in interest and value the general run of transport debates. The Minister of Transport anticipated back-benchers' criticism by announcing initiation by the Commission of a fully detailed and urgent review of the railway modernisation plan. This, he said, would take account of present and likely changes in traffic and would try to reassess the level of activity in the coal industry in particular and other matters which could not have been foreseen in 1956 when work on the plan began. The Commission was already having talks with the Coal Board, the Iron and Steel Board and the principal trade associations. The inquiry is to have regard particularly to the next five years "related to the future size of the railway system needed in view of current economic developments and future expected requirements." It is also to include a reappraisal of the economics of modernisation and the steps necessary to achieve the earliest possible break-even date based on an actual assessment of future traffic costs and economies. This is all to the good, and one can only regret that there is not to be a similar investigation into the field of road transport. Both Commission and Government are still working to the 1961-62 break-even date set in the White Paper, and the Minister assured the House that the Government would have to receive "complete economic justification" for any change in that date. The fact that they had been forced not to let matters rest was, he said, no criticism of Sir Brian Robertson and his colleagues nor a falsification of the 1956 prospectus.

Charges and Decentralisation

SEVERAL things have happened to upset the calculations and somewhat optimistic forecasts of the White Paper; the heavy decline in coal and other bulk traffics, for instance, could hardly have been anticipated. Additionally, there is the phenomenal growth in road transport and the unremitting tendency for traders to carry their own goods. All this can only be countered, failing restrictive legislation which no one in the industry appears to want, by lower rail rates for appropriate traffic and by dependable service. The first can come from full deployment of the new charges scheme and freedom to regain traffic in the light of market conditions; the latter can stem from progress in modernisation. In both cases time is the enemy, which can only be conquered by energy, enterprise, perseverance and good staff relations which, incidentally, the Commission's chairman has shown himself anxious to foster. In all directions decentralisation of management is proving salutary, and it is important that the regions should strive to regain the individuality which characterised the former railway companies. Most urgent is the need to stimulate the commercial side and to simplify the machinery of rates quotation to avoid frustrating delays in completing business transactions. The sales staff must be imbued with Acworth's injunction of 50 years ago: "First and foremost, get traffic!"; boldness, even if it means taking risks, should be everywhere encouraged.

Back-Benchers' Appreciation

A DENIAL of any movement among back-benchers to restore the railways to private enterprise came from Mr. J. W. Peyton, chairman of their transport committee, to whose recent activities we referred last week. He asserted that if the railways were to be a commercial undertaking then, despite all constituency aches and pains, it had to be accepted that the Commission was entitled to freedom. This is the sort of argument we have been voicing for years past. For too long, continued Mr. Peyton, the railways had been every comedian's whipping boy and the shuttlecock of party politicians. A contribution could be made to the efficient running of the railways by the public being reasonable in its approach and not by voicing petty, irresponsible criticism. Exactly, let the public support and, where possible, praise its railways! The debate was surprising also for the Opposition's criticism of the Minister's attitude to the Commission. True, an earlier Conservative administration was not particularly helpful, but the unprejudiced onlooker must surely share the Commission's appreciation of Mr. Watkinson's realism and readiness to grasp the facts of the transport position and to back the railway plan to the hilt. As he said, this was late in starting; but for this no fault rests with the Commission, which in its early days was refused even the modest capital resources necessary to make a beginning on modernisation.

Government and Railways

THE background to the railway picture is still obscure to many. It deserves recapitulation, and that must be our excuse for repeating a statement made in these columns earlier this year:

> Throughout the world, with minor exceptions, railways are experiencing financial difficulties for which, in this country, Parliament is largely to blame. Reverting to the earliest days, the land-owning element, predominant at Westminster in the early 19th century, encouraged extortion, thus increasing capital costs, while business interests in Parliament, born of the industrial revolution, encouraged competition and restrictions on charging.
>
> In more recent times two world wars produced railway controls which yielded handsome profits to Government, from whom the railways received scant consideration or encouragement in the difficult interim period when under quasi-monopolistic restrictions they had to fight increasingly fierce competition. And in the decade following the last war, despite latter-day public ownership, they were hamstrung by parsimonious capital resources. Based upon an intention to get the best out of transport in the national interest the principles underlying the Transport Act of 1947 were commendable, but its child the Commission, despite the duty to make its undertaking pay, soon found it was not master in its own domain.
>
> Unkindest cut of all was the 1953 Act's insistence that the Commission should sacrifice a big slice of its remunerative road haulage business, which had just begun to function as an entity. Though the blow was slackened somewhat by the last-minute removal of many of the out-dated restrictions on railway charging, magnanimity could not be claimed for that gesture because the railways would have been benefiting from it since 1939 had not the advent of war robbed them of justice under their "Square Deal" campaign. So neither Commission nor British Railways, despite their shortcomings, have reason to be thankful to Government.

Since these words were written the Government has at length displayed more realism and sympathy towards nationalised transport.

Uncommercial Waterways

WHILE the position on the freight side is difficult passenger receipts fortunately "are more than holding their own." In this direction the benefits of modernisation are already beginning to show themselves, particularly in the medium-distance services where diesel traction has been introduced. With the ever-widening scale of air competition close attention will have to be directed to the long-distance trains, and it is satisfactory that work on electrification is to be intensified. Replying to the debate the Parliamentary Secretary (Mr. Nugent) said the Minister hoped to make a statement soon after the Christmas recess on the Bowes report on inland waterways. Here will be an opportunity to deal sensibly with a long-standing problem by relieving the Commission of responsibility for all those waterways which can no longer contribute to the service of transport.

The Directors and Staff of

MODERN TRANSPORT

wish their Readers and Advertisers the World over a Very Happy Christmas and a Good New Year

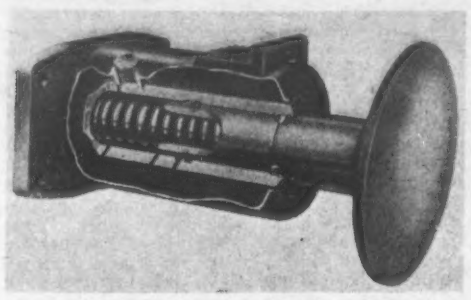
BUFFER AND COUPLING RESEARCH

A New Test Site for Railway Wagon Equipment

DOWTY HYDRAULIC BUFFERS AND AUTOMATIC COUPLERS

TO obtain the full benefits of faster freight trains and mechanised handling systems at terminals, or the door-to-door facilities of containers, involves the need of greater economies in the time and labour taken up in wagon marshalling and shunting. With loose couplings and hand brakes wagon handling and sorting take time, but the coupling of wagons fitted with continuous brakes involves a somewhat tedious time-consuming process. Hence arises a need for reinvestigation of automatic coupling under British conditions. The fact that damage to freight and wagons may be occasioned by impacts during marshalling is a further aspect demanding attention.

The development of new buffing and coupling equipment can alleviate these problems. Although final pre-acceptance proving is the



Section of Dowty hydraulic buffer

responsibility of the British Transport Commission, a good deal of original research and development has been undertaken by equipment manufacturers. The Dowty organisation, although a comparative newcomer into the railway equipment field, is strongly entrenched in the hydraulic engineering world. It can now claim the first self-contained, fully instrumented test site in England for carrying out under practical conditions all types of research and development concerned with the buffing and coupling of wagons. To date, these facilities have been engaged in the development of the Dowty hydraulic buffer and more recently an entirely new automatic central wagon coupler to meet B.T.C. specification. A short note on tests recently seen appeared in our November 22 issue. We now append a description of the test ground and of its evolution.

Hydraulic Buffer

It is first desirable to indicate the equipment evolved by the Dowty group. The buffer consists basically of a combined reservoir and cylinder, housing a piston loaded by a helical spring. On impact, the inward movement of the piston displaces fluid into the surrounding reservoir through orifices in the cylinder wall. The restriction imposed on the oil flow causes a back pressure which reacts on the piston, giving the buffer its resistance to closure. Only one dynamic seal is fitted and this is never subjected to high pressure, for adjacent to its pressure side a groove in the cylinder wall intersects holes leading to the reservoir. Thus pressure at the seal never exceeds the low reservoir pressure.

Unlike a mechanical spring which provides a fixed resistance for any given closure of the buffer, the reaction of this hydraulic buffer is related to the speed at which it closes. Due to the square law governing flow through orifices, the pressure generated in the buffer is directly proportional to the energy to be absorbed. Consequently the Dowty buffer is self-adjusting to change in impact energy resulting from variations in wagon velocity. Violent recoil is obviated by energy dissipation, instead of energy storage. Impact energy is converted into heat energy as the buffer closes, and the small quantity of air trapped in the buffer is compressed slightly as displaced fluid raises the level in the reservoir. On completion of the stroke the bulk of the impact energy has been dissipated and controlled recoil results from the combined effects of the load in the recoil spring and the air pressure.

Automatic Coupling

The Dowty automatic coupler incorporates simultaneous connections of the vacuum brake pipe and is compatible with all existing freight stock. It will engage and lock under a wide range of track curvature and gradient conditions, while uncoupling is achieved simply by operating a lever mounted on either side of each wagon. When coupling wagons not fitted with automatic couplers the unit can be swung through 90 deg. to present a standard drawhook. It is interchangeable with conventional draft gear without modifications to the wagon.

The manufacturer anticipates that this coupler will have a far-reaching effect, as the automatic coupler has posed considerable problems hitherto in Western Europe; there are virtually no automatic couplers for freight stock on main-line railways in this area. Intensive tests have been made, and British Railways is now testing 50 wagons fitted with Dowty units in the London Midland Region.

Evolution of Tests

Before describing the Dowty test site at Ashchurch, Gloucestershire, as it is now, it is worthwhile mentioning some of the more interesting aspects of its evolution. Developing suitable test equipment was in itself a considerable problem. Experience eventually proved that the only way to obtain the required data with complete accuracy is to use modern electronic equipment. Originally, the company was interested in buffing equipment so initial efforts were concentrated on providing suitable proving facilities. The first test arrangement consisted of a solid buffer block against which wagons were shunted by a small improvised locomotive, built out of a converted four-wheel drive 5-ton Bedford diesel-engined lorry. It is heavily ballasted and has had an axle and wheel conversion to suit standard-gauge rail track.

Eventual Satisfaction

To augment this arrangement a cable and weight method of propulsion was investigated which, though simple to operate, has a number of disadvantages. The object of this particular test is to analyse the buffer shock absorption characteristic which cannot be done accurately when part of the impact energy is dissipated by cable stretch and other external means. Furthermore, service recoil conditions would not be exactly reproduced with a wagon striking a solid stop. Hydraulic wagon movement was turned down for identical reasons. The next ideas to be investigated were the use of single and double pendulum systems; these were eventually shelved as too remote from operational conditions. The scheme finally adopted and now in operation involved two opposed ramps which enable all operating conditions to be factually reproduced. This set-up is described later along with a summary of the other Dowty proving facilities.

The site is extremely compact. The standard-gauge track is laid out to incorporate curves down to one chain radius with runs of straight track for speed testing. There is a direct connection to the B.R. line at Ashchurch. Mineral wagons of 16-ton capacity are used for normal operating tests; all standard types of wagon can be accommodated.

Test Site Layout

The centre piece of the site is the ramp layout for impact testing. There are two identical ramps built in line and each is equipped with dual track. The second track is isolated from the first and is used for endurance and destruction testing. Buffers and couplers are mounted on "dollies" for these tests to avoid unnecessary damage to complete wagons. The ramps are placed about 160 ft. apart and slope at angles of 15 deg. Impact speeds in excess of 25 m.p.h. are possible, or over three times current average shunting speed. Adjustable scotches are used to hold wagons on the ramps. These scotches, which slide on a light section rail, are located to determine impact speed and are pinned in position to their rails. The pin holes are spaced to allow impact speed adjustments in increments of 1 m.p.h. Winches, one for each ramp, are used for hauling the wagons. The winches are of standard manufacture and have been converted to hydraulic operation by employment of Dowty hydraulic motors.

The wagons are hauled by cable over the scotches, where they are held by their axles. An over-centre toggle mechanism actuated by a hydraulic ram is incorporated in each scotch. The wagons, which can bear gross laden weights up to 40 tons, are released by withdrawing the scotch rams. Two Dowty hydraulic pumps, joined in parallel, power the whole system and make available approximately 70 h.p. at the winch motors. A header tank and boost pump are included in the circuit to maintain a nominal pressure when the system is in operation. Maximum circuit working pressure is approximately 1,500 lb. sq. in. All operations are controlled from a console on the upper floor of the observation room, situated alongside the track between the ramps. Hydraulic pipes between the observation room, where the power and control units are housed, and the winch motors and scotch rams run in conduit below ground. The hydraulic equipment was provided by Dowty Hydraulic Units, Limited, from standard units.

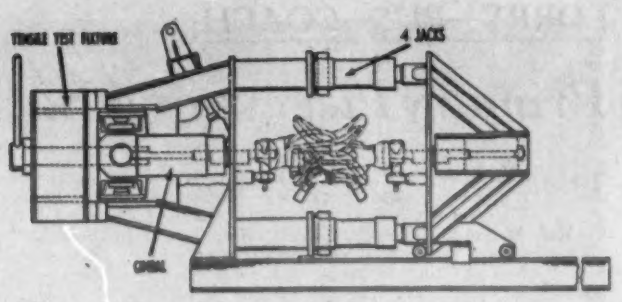
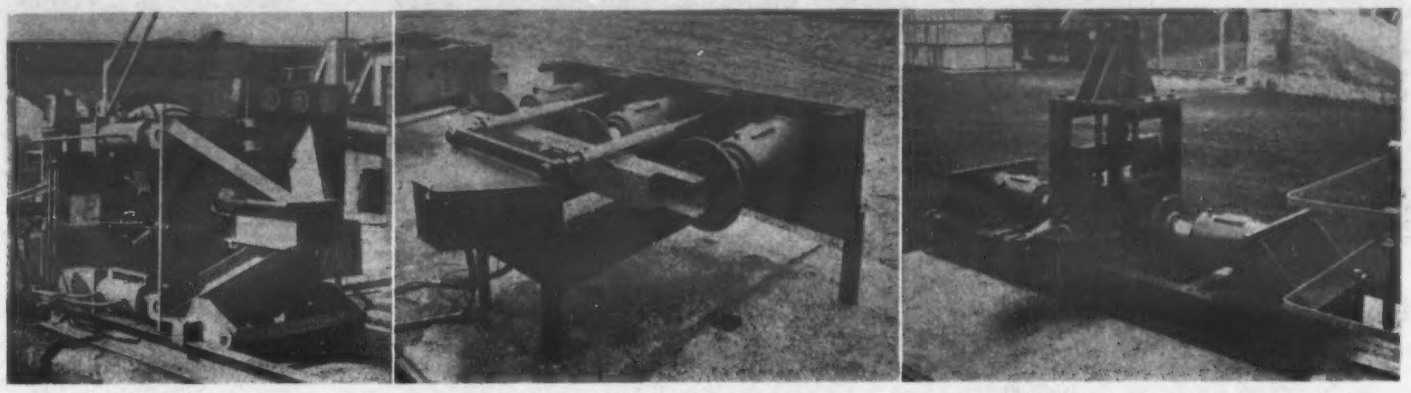
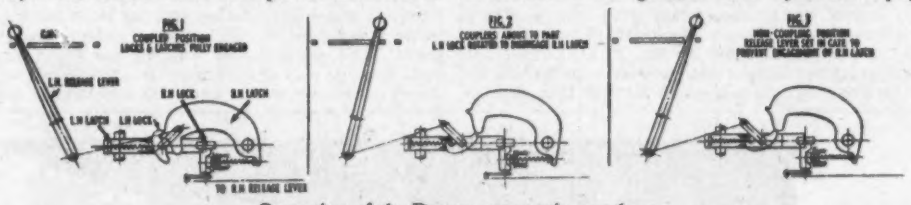


Diagram of test rig for automatic couplers



Test rigs at Ashchurch: equipment for testing couplers; endurance test for buffers; and, right, investigating wear on buffer heads



Operation of the Dowty automatic coupler

Fig. 1 shows a coupler in the couple position with both latches fully engaged. It will be seen that the left-hand latch has slid over and engaged with the right-hand latch and is firmly held by the right-hand lock. In turn the left-hand lock grips the projection on the right-hand latch

In Fig. 2 the release lever has been pulled over, thus swivelling the locking pawl which forces the right-hand latch out of engagement with the left-hand latch. This means that although the left-hand latch remains exactly as before, the right-hand latch has been pushed upwards so that it will clear the left-hand latch. It is consequently clear that it is only necessary to operate one release lever and not both

In Fig. 3 the release lever is placed in the gate so as to retain the locking pawl in the release position. This means that although the latches can be brought together the right-hand latch is unable to slip into engagement behind the left-hand latch as shown in Fig. 1

Buffer Testing

Buffer testing covers the electronic recording of three basic essentials from which it is possible to compile a complete performance analysis. A strain-gauge pressure pick-up is screwed into the end wall of the buffer pressure chamber to measure reaction variation on impact. This pick-up is a small cylinder on to which a strain gauge is wound; as the cylinder dilates under pressure the resistance of the gauge increases. The gauge is calibrated by switching a fixed resistance into the bridge. The second channel of the c.r.o. set records wagon motion.

A potentiometer, in which the sliding contact is fastened to a probe, is mounted so that the probe contacts the wagon 6 in. before the buffers meet. Just as the buffers touch the sliding contact is arranged to coincide on the potentiometer winding with a fixed contact which changes the polarity of the voltage after the slider has moved past this point. The time scale of these two traces is obtained by feeding signals at intervals of 1/200 sec., from a fork-controlled oscillator into the third c.r. channel and recording the pulses simultaneously with the signals from the other two channels. All three traces are recorded photographically.

From this information the following data can be calculated:

(a) Wagon impact velocity.
(b) Deceleration rate of wagon.
(c) Force reaction at buffer on impact and during deceleration.
(d) Buffer shock absorption capacity.
(e) Energy destruction efficiency of buffer.
(f) Buffer stresses.
(g) Kinetic energy of wagon.

By using additional strain gauges stresses in various parts of the wagon frame and the effect of load movement during impact are also analysed.

Coupling Tests

In so far as coupler testing on the ramps is concerned, the object is to prove the geometry of the design and the strength of the materials under accelerated endurance shunting conditions. Instrumentation is used to record the efficiency of the automatic vacuum braking connection incorporated in the coupler. Gathering and uncoupling tests are undertaken on a special section of track, which has been laid down to reproduce simultaneously the most severe curvature conditions occurring on British Railways and a comprehensive range of vertical and horizontal misalignment.

The site includes a number of static rigs for endurance and fatigue testing under specific conditions. On one rig buffers are subjected to a rapid cycling test to establish the rate of buffer head wear and also the efficiency of the sealing arrangement. The rig automatically cycles at 40 full closures per minute. Buffers undergo this test in batches of six, so that test figures are compiled from a factual average. So far it has been established that after 200,000 complete cycles about one pint of oil is lost. In terms of railway usage this means that a buffer will require oil replenishment once in every five years.

Draft Simulation

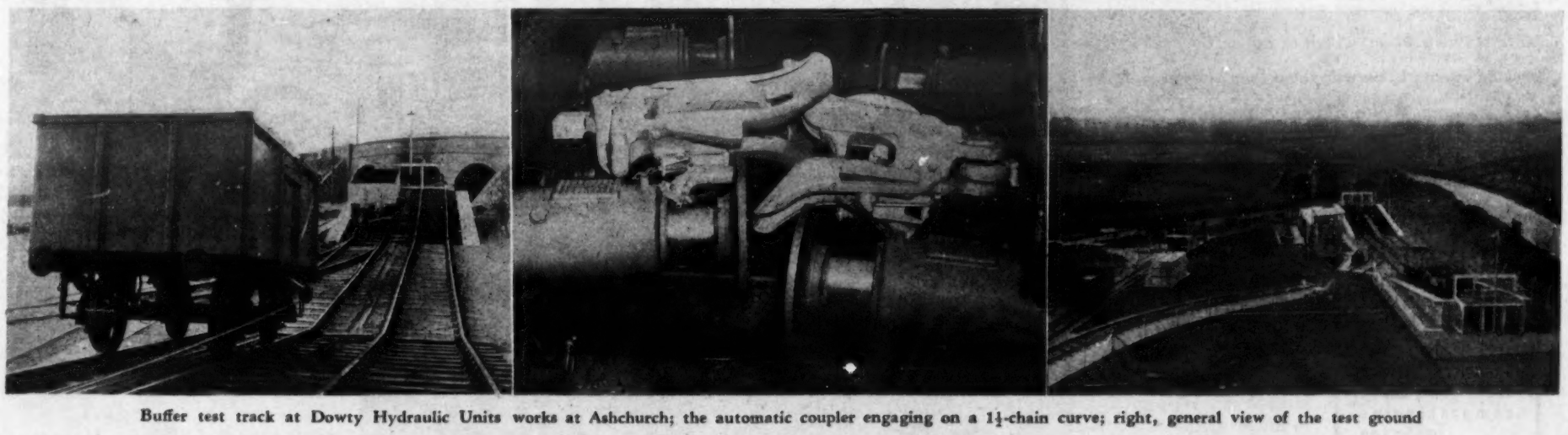
Couplers are placed in a draft simulation rig which rapidly varies the misalignment whilst maintaining a heavy drawbar pull. This rig subjects the coupler to conditions far worse than would be encountered in service. An enclosure built around the rig enables environmental and climatic tests to be undertaken. Dust, sand and water can be injected into the enclosure in turn at varying intervals. Freezing conditions can also be created. Instruments indicate the degrees of misalignment, drawbar pull and vacuum connection efficiency of the couplings under test.

All the rigs are hydraulically operated and are extremely interesting applications of hydraulics from an engineering viewpoint. Particularly so is the draft simulation rig which produces a number of misalignment conditions at irregular intervals and at varying speeds. This is achieved with standard Dowty control units.

Buffer Head Strength

At the end of the straight track is the original 70-ton concrete buffer block now used, among other things, for the standard British Railways inspection test for buffer head strength. Buffers are mounted on the block at an angle of 30 deg. and are impacted by a buffer plate attached to the wagon. Impact speeds up to 17 m.p.h. are attainable. High-speed cameras show that during impact tests with a 40-ton laden wagon the block moves 1½ in. and then gradually returns.

The Dowty group was originated in 1931 by Mr. (now Sir) George H. Dowty, who wished to improve aircraft undercarriages. Since the war components for gas turbine fuel systems, rubber seals, electrical equipment and pit props have been added to the products; there are 18 companies in the group.



Buffer test track at Dowty Hydraulic Units works at Ashchurch; the automatic coupler engaging on a 1¼-chain curve; right, general view of the test ground

LORRY—BUS—COACH

Primary Licence and Backings Differed

DECISION has been given by the Minister of Transport against Associated Motorways on an appeal against the joint decision of the East Midland, Eastern and Metropolitan Traffic Commissioners refusing intermediate picking-up points when granting backings of a road service licence to operate an express service between Cheltenham and Felixstowe. The Minister says that he appreciates the value to the public of comprehensive networks of long-distance services provided by operators working together within the terms of their licences. He has carefully considered the evidence offered in support of intermediate as well as through facilities on this service and has taken into account the modifications made in the original applications and the evidence offered of existing intermediate facilities and of the possibility of abstraction of traffic from them. On balance, he concludes that the appellant failed to show that the unsatisfied need for such a service was sufficiently strong to justify its introduction.

The Minister notes that the decisions of the backing commissioners differ from the decision of the commissioners for the primary area. He agrees that the grant is accordingly limited by the former and is of opinion that traffic commissioners, whether considering applications for licences or backings, may have regard to matters arising outside their area that may affect the service insofar as it is to be provided within their area, including such matters as whence the passengers are to come and what other services are available to them, and may attach conditions to a licence or backing affecting the provision of the service in their own area notwithstanding that observance of the conditions may affect the service outside their area. The appeal inquiry was held on April 14.

South Lancashire Trolleybuses

WE are asked by the secretary of Lancashire United Transport, Limited, to point out that the luncheon held at Wigan on September 1, to which reference was made in an article on the South Lancashire trolleybus system in our December 6 issue, was held to commemorate the winding-up of the South Lancashire Transport Company and not as suggested by the author of the article.

Special A Renewal Procedures Vary

WRITING in the *Road Way*, journal of the Road Haulage Association, this month, Mr. P. S. Woodhouse, secretary of the Metropolitan and South Eastern area, refers to the renewal of special A-licences. Some hauliers, he notes, are not awaiting the renewal date, but are applying for a variation of their ordinary A-licence to include thereon their special A-licensed vehicles on the understanding that the special A-licences are then surrendered. Alternatively, an operator can wait until renewal time and apply for either a new A-licence in continuation of the special A-licence, or for the vehicles to be added to his existing A-licence. The Northern area reports that operators therein who hold ordinary A-licences are to be sent form GV6 when special A-licences come up for renewal, in order that the specified vehicles may be transferred to the ordinary A-licence, with the same expiry date. Operators without an ordinary A-licence will receive form GV1A on which to make application for a new licence.

Wigan Depot Completed

OFFICIAL opening by the chairman of the North Western area Traffic Commissioners, Mr. F. Williamson, of an administrative block on December 11 marked the final stage in the conversion of the former tram depot of Wigan Corporation Transport Department into a modern bus garage, housing the present fleet of 154 buses. A new bus running shed was erected alongside the former tram shed during the early part of the 1939-45 war (the last tram ran in 1931), and in 1946 conversion of the old shed was taken in hand. Since then there have been numerous improvements and additions to the depot. Both sheds have underfloor heating.

Two independent Irish operators link the county towns of Cavan and Longford. Jackson Transport, of Cavan, operates this ex-Southdown Leyland Tiger via Arva (left) and P. Donnelly, of Granard, works via that town with a fleet which includes this Bedford

Maintenance of Lights and Reflectors

THE Minister of Transport has published draft proposals to make regulations which will make it compulsory for the owners of motor vehicles which are fitted with lighting equipment to keep the obligatory lights and reflectors, and any lamps which might dazzle, in proper condition by day as well as by night, except that lighting and reflectors need not be fitted to a vehicle which it is intended never to use in darkness.

Service Pruning in West Country

IN a successful application for fare increases at Bristol on Thursday last week the Southern National and Western National Omnibus companies were represented by Mr. T. D. Corpe. The companies applied for increases of a halfpenny on fares from 3½d. to 10d. and for the 10d. fare to become 11d. They were needed to meet a sum of £28,600 which was one-third of the additional costs amounting to £110,200 which the companies have had to bear. A saving on fuel and tyres had resulted in savings amounting to £35,000. The companies had to bear additional operating costs of £74,700 which would be rectified by trimming unremunerative services, a process only just begun and which would take considerable time.

Halfpennies On and Off

CONFRONTED with the need for an additional £80,000 to meet the cost of the recent wage award, Southdown Motor Services, Limited, will apply to the South Eastern area Traffic Commissioners for sanction for certain fare increases, which the traffic manager (Mr. G. Duckworth) describes as "relatively small." The proposals will not affect fares charged locally in Brighton, Hove, Portslade and Southwick; or in Eastbourne and Portsmouth. Other Southdown routes will, however, be affected by the proposals, the effect of which will be to shorten the distances permitted for fare values up to 8d. Intermediate fares of 2½d. and 3½d. values will be reintroduced, and there will also be an adjustment of return fares and season ticket rates. The company hopes by these increases and adjustments to raise about £40,000 additional revenue. To offset the other £40,000 required, it is proposed to reduce certain services, particularly at the off-peak periods. In contrast, Maidstone and District Motor Services, Limited, proposes to secure to meet part of the additional £80,000 it needs by removing certain fares incorporating halfpence and introduced experimentally last year. These fares were 2½d., 3½d., 4½d. and 5½d.; each will be rounded up by one halfpenny.

Higher Speed Limits for Buses and Vans

THE Minister of Transport is seeking the views of representative organisations on a proposal to increase from 30 m.p.h. to 40 m.p.h. the speed limit for buses and coaches and the limit for goods vehicles not over 30 cwt. unladen, outside built-up areas. The proposed increase in the speed limit would apply only if no trailer or semi-trailer were drawn. Goods vehicles under 30 cwt. would have to be marked to show their unladen weight if the driver wished to exceed 30 m.p.h.

The main grounds on which this change is advocated are that the present limit for these types of vehicles is widely disregarded and treated as unrealistic. The change could be fully justified on grounds of the technical development over the last 28 years, and would be more realistic and promote a more even traffic flow on derestricted and 40-m.p.h. roads. Nearly all the modern vans and trucks which would be covered by the proposals are adaptations of the same chassis or basic framework as popular private motor car models. While buses and coaches are larger and heavier than these light vans and trucks, they are fully equipped to satisfy the braking and other requirements appropriate for higher speeds, and their maintenance, which is closely supervised, and the standard of driving are of a high quality. The changes have the support of the preponderating opinion of the Committee on Road Safety.

L.T. Wage Differential Issue Forced

REPRESENTATIVES of London busmen who met representatives of London Transport last week to consider the effect on London Transport bus wages of the award of an increase of 7s. a week to provincial bus company workers, 2s. more than the London Country busmen received from July 2, were told that further consideration of their claim of an additional 2s. per week should wait for the T. and G.W.U. to come to a conclusion as to what it considered were the proper differentials between London and provincial bus workers. The union case in support of the 2s. claim was that the L.T.E. had declared in the settlement of the London dispute that it was not intended that the wages of London Country men should be left in an unfavourable position in relation to those of comparable workers elsewhere.

Explaining this determined attempt by London Transport to end "leap-frogging" in the industry, Mr. A. Bull, labour relations member of the Executive, pointed out that since the London men received their increase on July 2 and the provincial men theirs at the end of October, it would not be until July next year that the larger provincial increase would have compensated them for the later settlement, so that the London men were not at present under any disadvantage. He said that in recent claims the unions had used the differential as a reason for asking for more money for the provincial men. Indeed the existing difference might have influenced the tribunal in their 7s. award. The differential is still 7s. 6d. a week. If it were to be increased to 9s. 6d. that could be used in a future claim for provincial men.

Bus and Coach Developments

Starkey Motors (Pentee), Limited, has been renamed D. G. Weaver (Motors), Limited.

Bowermans Tours, Limited, Taunton, applies for the licences of A. A. Woodbury, Wellington.

Ian B. Glass, Haddington, seeks the Haddington—Dunbar service of J. Ewart and to operate on Thursdays, Saturdays and Sundays only.

W. Alexander and Sons, Limited, desires to replace Saturday journeys between Falkirk and Dunipace by a Falkirk—Dunipace—Stirling service.

Southdown Motor Services, Limited, proposes to revise its Burgess Hill local route (130), withdrawing the section from West Park Estate to Goddards Green and establishing a loop at the St. Andrew's Road end.

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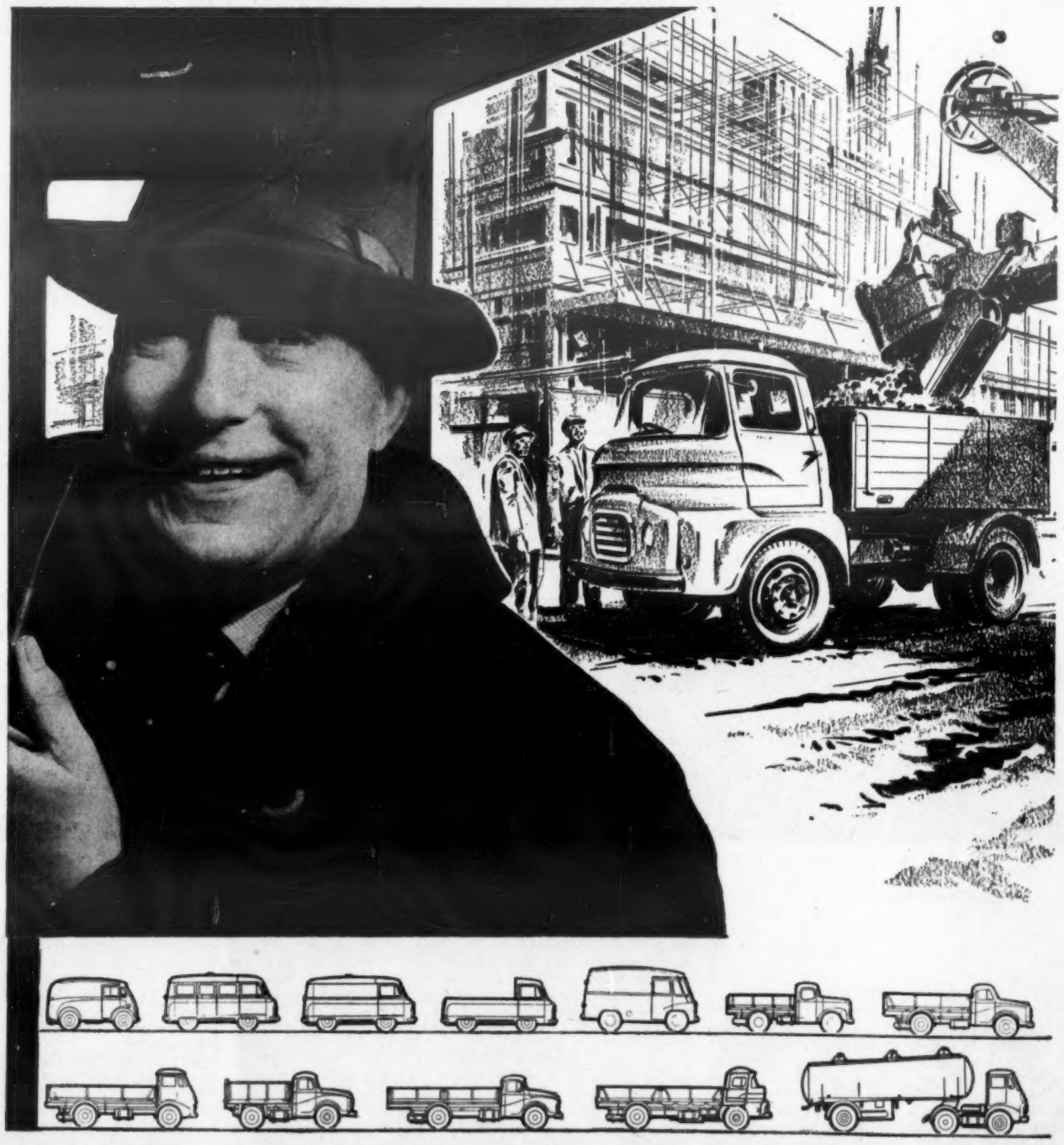

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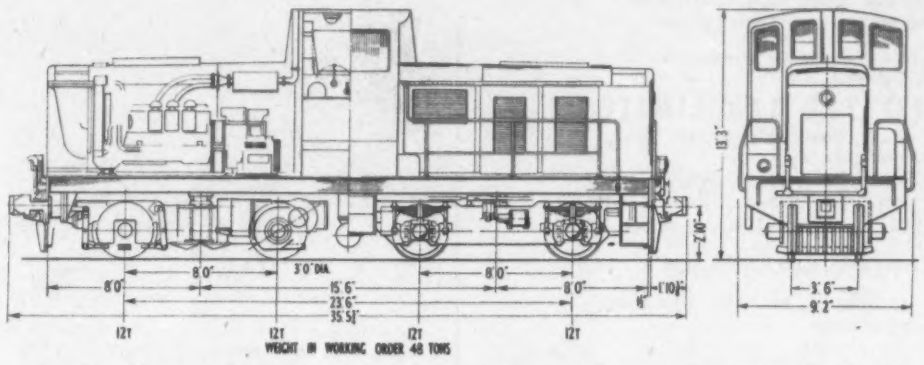
ADDITIONS TO A DIESEL LOCOMOTIVE RANGE

Latest Yorkshire Engine Units

AMONG the several smaller British locomotive building concerns which have in recent years established themselves in the field of diesel traction is the Yorkshire Engine Company of Sheffield. Founded in 1865 as a locomotive and general engineering works, the firm remained independent until 1945, when it became a subsidiary of the United Steel Companies, Limited. Under the aegis of this powerful group the previously declining output was revived and has continued to improve steadily over the past decade, so that today the order books present impressive evidence of a thriving trade, and the production of locomotives has risen to an average of one a week.

Steam locomotives continued to be the staple



Side and end elevations of 400-h.p. 3 ft. 6 in. gauge diesel-electric locomotive for British Guiana

produce until 1951 since when orders have slowly declined, and ceased altogether when the last one was handed over to British Railways during 1956. Although work continues on replacement parts, repairs and spare boilers, new construction is now confined to diesel traction, and already the company has evolved its own range of standard shunting locomotives, which apart from external sales, have an assured market in the numerous branches of the United Steel Companies works.

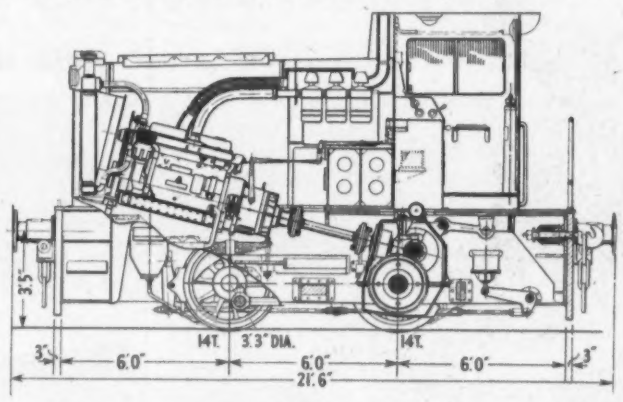
New 170-h.p. Units

The latest additions to the machines available include a 170-h.p. diesel-hydraulic type and a double-bogie version of the 400-h.p. Janus class of diesel-electric shunter designed to meet overseas requirements. The former can be supplied with the 0-4-0 or 0-6-0 wheel arrangements according to axle loading restrictions; the overall weight is approximately 28 tons. The maximum tractive effort is 16,400 lb. and 14,800 lb. can be exerted continuously at 1.3 m.p.h. The power unit is the Rolls-Royce normally aspirated C6NFL type with an output of 178 h.p. at 1,800 r.p.m. and a Rolls-Royce CF10,000-1 three-stage torque converter transmits the power to a 11.5 to 1 double reduction final drive box through a Layrub flexible shaft. No jackshaft is needed; engine and transmission, as will be seen from the diagram, are steeply inclined in the chassis and three-point mounted.

The lengths of the 0-4-0 and 0-6-0 machines are respectively 21 ft. 6 in. and 22 ft. 2 in. over buffers; on standard gauge the normal overall width is 8 ft. 5¼ in. and the height 11 ft. 3¾ in. with 3 ft. 3 in. wheels. The overall dimensions can be altered to suit the loading gauge and the fuel tank capacity of 200 gal. can also be modified. The four-coupled engine, with 6-ft. wheelbase, can traverse a curve of 60 ft. radius, but 100 ft. is the minimum for the six-coupled machine, which has a 9-ft. wheelbase. Timken taper roller bearing axleboxes are fitted. The Westinghouse straight air brake is provided; the compressor, of a nominal capacity of 15 cu. ft. min. at 1,000 r.p.m., is belt driven.

Controls

There are two driving positions in the cab which provides a comfortable stance (warmed by a Clayton Dewandre heater) and a good lookout. The



General arrangement drawing of the 170-h.p. diesel-hydraulic locomotive as a four-wheeler

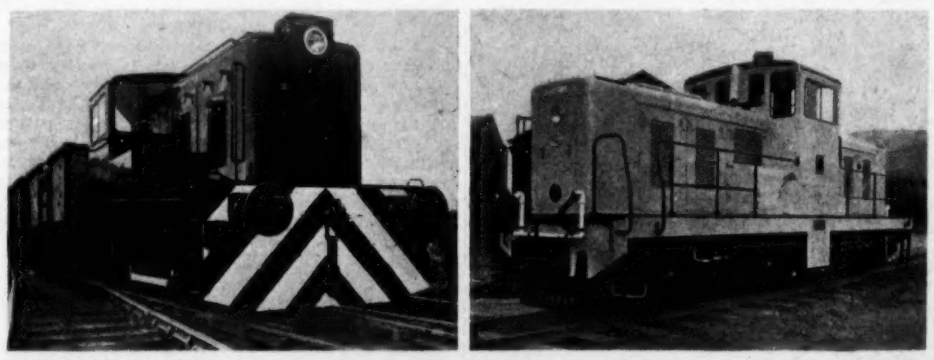
controls are conveniently grouped for speedy handling of shunting operations. Westinghouse pneumatic equipment is used for actuation of the forward and reverse control gear which can be operated only when the locomotive is quite stationary. The CF type Rolls-Royce three-stage torque converter gives a continuously variable torque output throughout its range. This is sufficiently wide to provide ample tractive effort and speed for a shunting locomotive of this type without the necessity of incorporating a changespeed gearbox or several converters operating over different speed ranges. The control system can thus be extremely simple and the driver is thus enabled to concentrate upon his shunting work.

Electrical equipment includes a 24-volt D.P. lead-acid battery of 154 ampere-hour capacity at the 5-hr. rate of discharge; the starter motor is a standard C.A.V. unit and the 24-volt generator is rated at 480 watts. With hydraulic transmission at its Sheffield works. These machines have been ordered by the African Manganese Company (Mines Management), Limited, through its consulting engineers, Livesey and Henderson. Based on the Yorkshire Engine Company's successful twin-engined Janus 400 h.p. 0-6-0, it has been given a double bogie wheel arrangement for export purposes. The locomotives are required for the African Manganese Company's mining project in north-west Guiana, where a 3 ft. 6 in. gauge railway system is being built, extending approximately 30 miles from the mine to the river shipping station.

The maximum load to be hauled is 370 tons against the load where the steepest gradient is 1 in 100. Average speed will be about 14 m.p.h. with the loaded train taking slightly over three hours for the journey, while the return trip with the empty train will take about 1¼ hours at an average speed of 22 m.p.h. Maximum speed of the locomotive is 30 m.p.h. In addition to the three 400-h.p. locomotives, the African Manganese Company has also ordered one 230-h.p. shunting locomotive of the 0-6-0 wheel arrangement; this is powered by one engine and transmission of similar type, thereby facilitating maintenance.

Rolls-Royce—B.T.H. Transmission

This 3 ft. 6 in. gauge Bo-Bo diesel-electric locomotive weighs 48 tons with a maximum axle load of 12 tons; it provides a starting tractive effort of 28,000 lb. The continuous tractive effort at 6.8 m.p.h. is 12,800 lb. and the tractive effort-adhesion ratio is 26 per cent. The driving wheels are 3 ft. in diameter and the total wheelbase



The new locomotives: Left, the 0-4-0 shunting design; right, the Yorkshire Engine double bogie freight engine with Rolls-Royce—B.T.H. transmission

23 ft. 6 in., that of each bogie being 8 ft. There is a 400-gal. fuel capacity. Power is provided by two Rolls-Royce C8NFL oil engines, each rated at 202 h.p. at 1,800 r.p.m. Of the total output 370 h.p. is available for traction. The engines are coupled to two B.T.H. RTB7426 generators and the drive is by four B.T.H. motors of type 119Z, which transmit through a double reduction gearbox with a ratio of 10.53 to 1.

The brake equipment is the Westinghouse vacuum-controlled straight air brake; the rigging is fully compensated. Vacuum brake equipment is used on the trains and is applied by a vacuum-air proportional valve, ensuring simultaneous and proportional application. There is an independent engine speed-up device placed in the throttle control to suit exhauster requirements. Deadman control equipment is provided to safeguard against illness overtaking the driver. The machine is an impressive addition to the Yorkshire Engine range.

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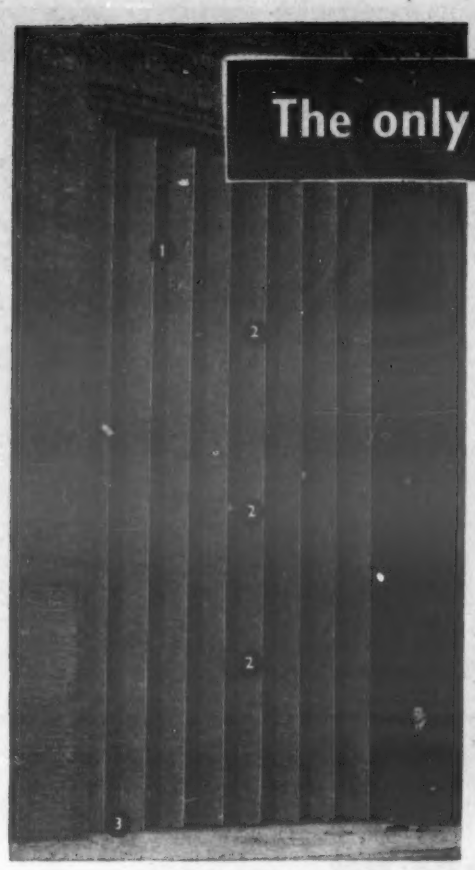

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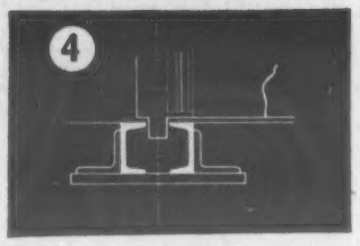

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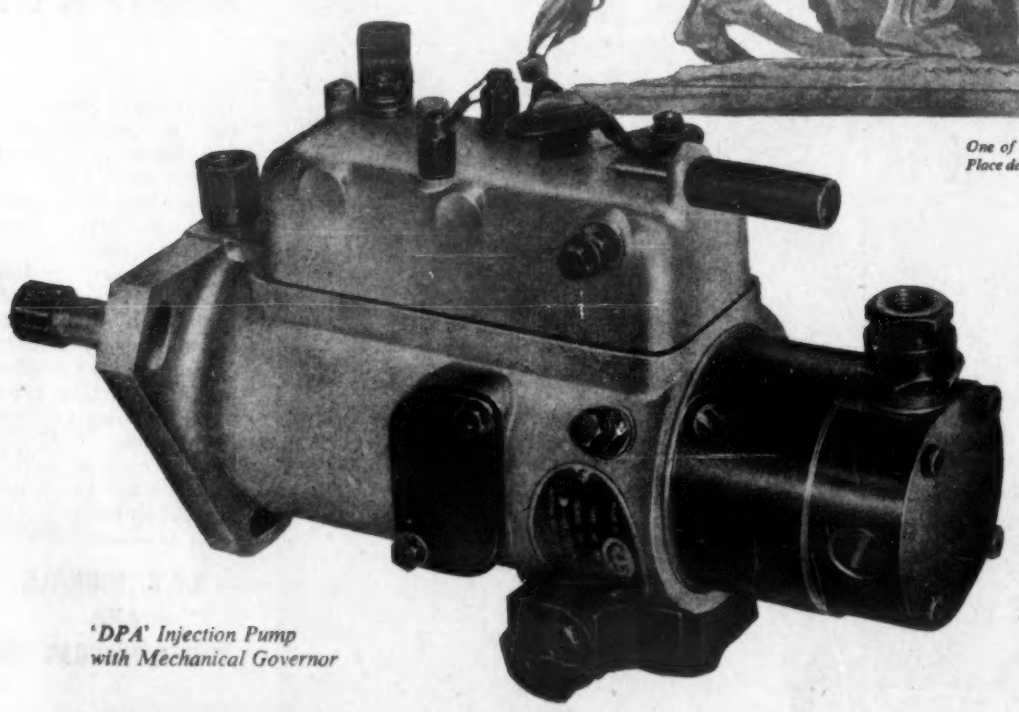

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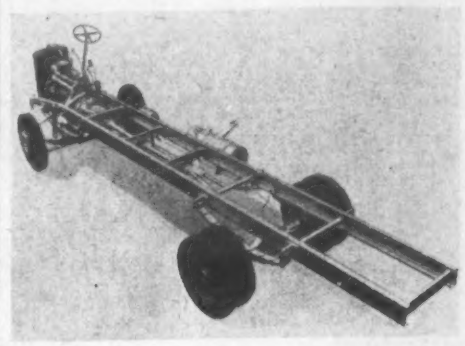
VICTOR REDESIGNED

New Units for Albion Single-decker

NEW running units and a higher permitted gross weight are features of a new range of Victor vertical-engined single-deck passenger chassis announced by Albion Motors, Limited. As the previous Albion Victor, which has had particular success in overseas markets where the going is tough, the new range is of sturdy straightforward design and is offered in two wheelbase lengths of 15 ft. 6 in. and 17 ft. 3 in., giving chassis lengths of 26 ft. 8½ in. and 29 ft. 5½ in. respectively. Each wheelbase length is available with either Albion four-cylinder diesel of 90 b.h.p. at 2,200 r.p.m. and 252 lb./ft. torque at 1,250 r.p.m. (VT15N and VT15L) or Leyland six-cylinder diesel of 94 b.h.p. at 2,000 r.p.m. and 255 lb./ft. torque at 1,400 r.p.m. (VT17N and VT17L). Equipped chassis weight ranges from 59½ to 60¾ cwt. and all have a width of 7 ft. 5½ in. with standard 8.75-20 10-ply tyres and are intended for a maximum gross weight of 8½ tons—half a ton more than the



New Albion Victor passenger chassis, in this case with the alternative Leyland O350 diesel engine

original Victor. VT15 chassis have right-hand drive only while VT17 chassis can be either right- or left-hand drive.

Transmission is through a hydraulically operated single dryplate clutch and the Albion five-speed constant-mesh gearbox, which is available with overdrive sixth speed, to the new Albion double-reduction rear axle which has now become standard equipment on several new Albion chassis in place of the earlier worm-drive unit. Road springs of increased length and width are fitted with telescopic dampers at the front and larger brakes, now providing a total lining area of 494 sq. in., are hydraulically operated with Clayton Dewandre Hydrovac vacuum assistance.

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NEW ROADAIR SERVICE

For Export Cars

A NEW type of Continental delivery service for British export cars has been introduced by Silver City Airways and is now operated between Lydd (Ferryfield) Airport, Kent, and any town in Belgium, Germany, Holland and Switzerland. The principle of the new service, which is part of Silver City's Roadair operations, is that export cars after normal road delivery to Lydd

A batch of Standard cars loading directly on to a road transporter from Silver City's Roadair service at Le Touquet en route for Antwerp

Airport fly on the regular year-round freight ferry by Bristol Superfreighters to Le Touquet; there they are met by large road transporters under contract to the airline and conveyed to their ultimate destination. The transporters carry from five large to eight small cars at a time.

Compared with all-surface methods of export car delivery the new Roadair service is said to show savings in time and cost while the risk of accidental damage is greatly reduced. The airline arranges, without extra charge, comprehensive vehicle and loading insurances and all Customs requirements en route. Already a trial run has been made by the Standard Motor Company, which has sent by Roadair a batch of six Vanguards from Lydd to Antwerp and has commented favourably on the service.

★

Forthcoming Events

December 20.—Light Railway Transport League. Paper by Mr. V. E. Burrows, "London File, 1930." At 153 Drummond Street, N.W.1. 3 p.m.

January 3.—Norbury Transport and Model Railway Club. Visit to Wimbledon Electric Car Depot.

Stephenson Locomotive Society (North Western). Paper by Mr. W. O. Skeat, "Some Great Eastern Locomotives." At Y.M.C.A., Fargate, Sheffield. 6.30 p.m.

January 5.—Historical Model Railway Society. Paper by Mr. A. J. Thorn, "Modelling a Railway Steamer." At Railway Tavern, Liverpool Street, E.C.3. 7 p.m.

Institute of Transport (Metropolitan). Paper by Mr. D. McKenna, "Work Study and Transport." At 80 Portland Place, W.1. 8 p.m.

January 6.—Institute of Transport (Midland). Paper by Mr. N. P. Brand, "Road Development in Birmingham." At Birmingham Exchange and Engineering Centre, Stephenson Place, Birmingham. 6.30 p.m.

Institute of Traffic Administration. Annual general meeting and discussion, "C-licences—are they too easily obtained?" At Chamber of Commerce, Southampton. 7.30 p.m.

Railway Correspondence and Travel Society (Sheffield). Paper by Mr. R. H. Harrison, "York Railway Museum." At Livesey Clegg House, Union Street, Sheffield. 7.30 p.m.

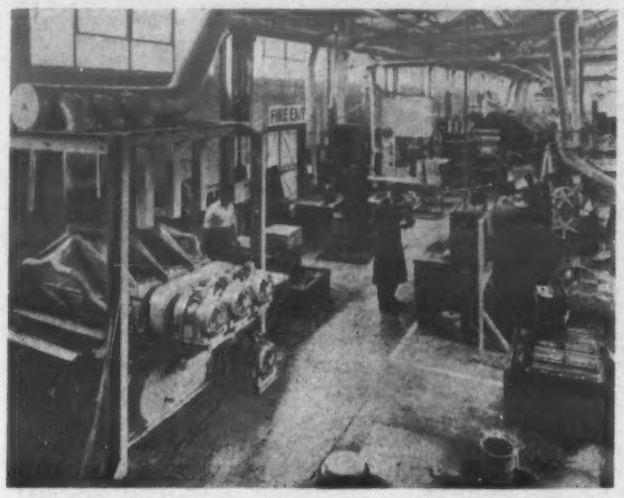
South Wales and Monmouthshire Railways and Docks Lecture and Debating Society (Newport). Paper by Mr. S. C. Harvey, "The Commercial Challenge to the Railways." At Dining Room, Newport High Street Station. 6.45 p.m.

RAILKO'S NEW HOME

Factory on Birfield Site at Loudwater

NON-METALLIC anti-friction materials have been finding gradually increasing use in railway vehicles over the past 20 years or so and their application now extends to such points as bogie centres, side bearers, bolster rubbing plates, horncheek guides, spring hangers, brake linkages and so on, while the variety of types of material available has been increased considerably. Frequently, the generic term fabric liners is used in specifications, perhaps without appreciating that the riding qualities of a particular vehicle can vary widely according to the grade of material used at these points.

An opportunity of seeing some of the work of development and the production of these specialised reinforced plastics was afforded recently by Railko, Limited, which entertained groups of railwaymen from both the manufacturing and operating sides of the industry at its new factory. The visits, which we reported briefly in our issue for November 15, served also to illustrate the way in which specific qualities can be designed into an anti-friction material to meet a particular duty and to publicise the Railko design technical service, whose specialist staff is available to advise users. This service is now frequently sought in various fields in which Railko products are used right from the project design stage but is apparently not so well known or used by railway rolling-stock engineers.



A general view of the new Railko factory showing extensive fume and dust extraction arrangements

Railko products comprise a wide range of engineering bearings and laminates composed of a reinforcing fabric impregnated with synthetic resins and friction modifiers which are formed into shape in curing presses. It is used for heavy-duty mill bearings, silent gears, railway wearing plates, marine stern tube bearings, diesel engine fuel pump couplings and many other applications where operating conditions are difficult. The fibres, resins and other constituents can be varied to impart one or more specific properties to overcome specific difficulties.

Beneficial Properties

Among the useful general properties of Railko are high specific and compressive strengths; good electrical insulation and high thermal insulation; low friction coefficients; proof against micro-organisms; lubrication by a variety of fluids or none; resistance to acids, alkalis and corrosive atmospheres; good weathering; resistance to abrasion; dimensional stability; and machinability. The material is produced in a variety of standard grades in which the fibres are either asbestos or cotton and in high-tensile and graphite- or oil-impregnated forms.

Development

Railko was developed by Small and Parkes, Limited, out of experience gained in the production of belting and non-metallic friction and anti-friction materials over the years since Mr. H. G. Small founded the business in 1881 for the purpose of producing frictionless steam engine packings. The name Railko is a contraction of those of two other Small and Parkes products, Railite oilless bearings and Roko webbing. The company's first essay into work with laminated plastics was in 1920 and its first product of this type was a friction material used for road vehicle brake linings. One of the big users at the time was the London General Omnibus Company.

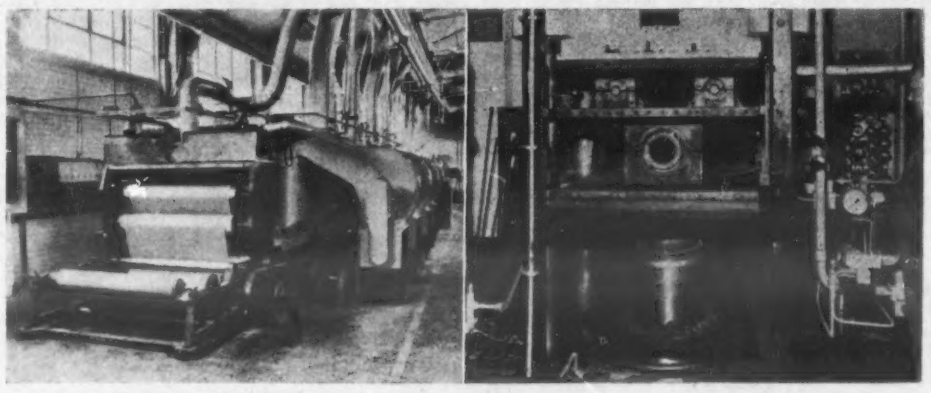
Progress with the means of controlling the friction coefficient of the finished material led to the development of Railko, which first found practical application in an Indian Railways locomotive in 1935. After an accident which was considered to have been caused by front-end hunting of the locomotive, a high-friction Railko material was substituted for the previously used phosphor bronze bogie centre liners. This proved effective and by 1939 large quantities of Railko liners for rolling stock wearing plates were being supplied to Indian Railways and other operators and applications in the other fields mentioned earlier have been steadily extended.

This expansion of the uses of Railko posed problems for Small and Parkes, whose major commitment was to meet the ever-increasing demand for its products for the motor industry. Consequently, in 1957, Railko, Limited, was acquired by the Birfield Group, one of whose other companies—Laycock Engineering, Limited—had already been the selling agent for Railko for a number of years and whose sales engineers have wide contacts in the railway and other industries.

Work was put in hand immediately by the Birfield Group on the erection of a new factory and administrative offices on the large site at Loudwater, High Wycombe, Bucks, occupied by another of the Birfield companies, T. B. Ford, Limited. The factory was built and equipped in a remarkably short time, only seven months having elapsed from the start of building operations in July, 1957, to the first production from Loudwater. The factory equipment comprises principally storage and mixing facilities for the resins and friction modifiers, a large plant for the impregnation and drying of the various types of fabric used and a variety of high-pressure hydraulic presses with heated dies in which the components are moulded and cured.

Grinding and cutting machines are also installed but these are few as the bulk of the machining to finished shape and dimensions is carried out by other companies in the group. A notable feature of the new factory is the elaborate plant for the extraction of fumes from the resin-drying ovens and dust from the cutting and grinding operations.

Research plays an extremely important part in the development of Railko specifications to meet particular requirements and well-equipped physical and chemical laboratories are at present housed in a temporary building on the site. Research is to be stepped up considerably and the company is seeking planning permisson to build a permanent research and development centre at Loudwater.



One pass through this plant impregnates the fabric with resin mix, dries out the solvents and leaves the material in handleable and storable thermoplastic condition; right, one of the big presses in which Railko components are formed and cured in steam-heated moulds

Contrasted with a Titan 56-seater, Wallasey Corporation's new Leyland-M.C.W. 77-seat Atlantean, which went into service last week, passing Wallasey Town Hall; right, the Atlantean loading at the Seacombe Ferry terminus. As can be seen, a portable pier, having guard rails and red warning lights to guide other drivers backing in alongside at night, is used to bring passengers to the front entrance

FLEXIBLE OPERATING CHARACTERISTICS

Photos by courtesy of Metropolitan-Vickers Electrical Co. Ltd.

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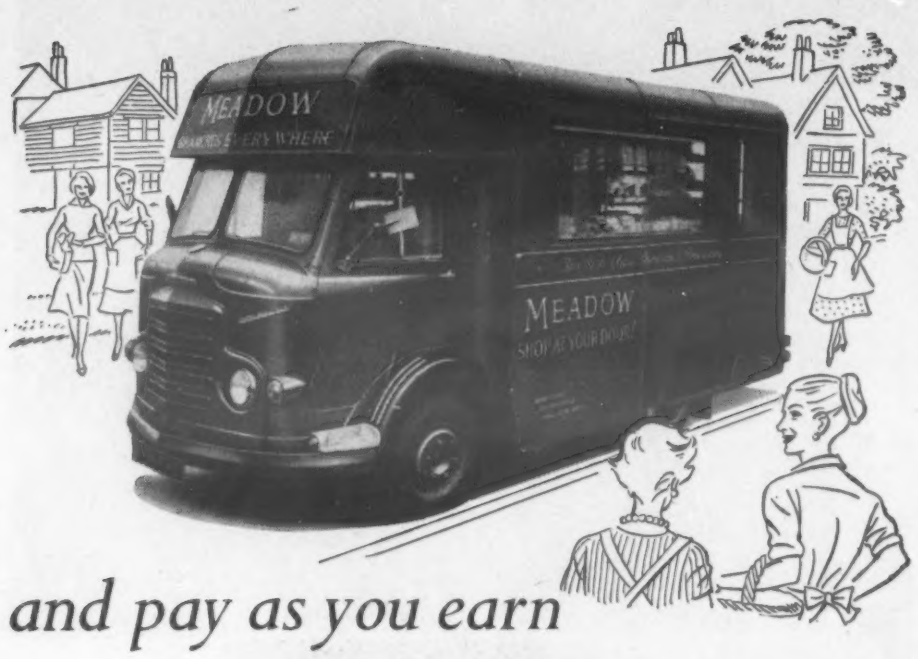

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NEWS FROM ALL QUARTERS

Bo'ness Docks Closing Date

Bo'ness Docks will close on June 30, 1959, unless the Minister of Transport intervenes to reverse a decision of the Scottish area Transport Users Consultative Committee. The Commission has stated that the docks caused a loss of some £300,000 over the last 10 years.

Couchette Berths on French Railways

Couchette berths now available on French Railways (excluding Wagons-Lits berths) have risen in numbers to 3,566 in first class and 13,338 in second class. The comparable figures in 1946 were 564 in first class and 1,284 in second class. By 1961 it is hoped that there will be available a total of 4,980 berths in first class and 31,590 in second class.

Christmas Passenger Train Plans

British Railways plans to run more than 1,600 additional main-line trains during the Christmas holidays, principally on Christmas Eve and Sunday, December 28. In England and Wales, there will be a Sunday service, adjusted as necessary, on Christmas Day and Boxing Day, except in the Southern Region where special services will operate. There will also be adjustments to the normal Saturday services on Saturday, December 27.

End of L.N.W.R. 0-6-2 Coal Tanks

The last of 300 class 2 "Coal" tank engines made in Crewe works by the former London and North Western Railway between 1881 and 1897 has been sent to works for breaking up. Numbered 58926, she and her sisters were built to the design of Mr. F. W. Webb and were used mainly for working heavy coal trains in the colliery districts of South Wales and elsewhere. From 1914 onwards a large number was fitted with apparatus for working push-and-pull trains.

Carriage of Dangerous Goods by Rail

Revised regulations about the carriage of dangerous goods by rail which come into force on January 1 next are contained in a second edition of the international convention on this subject. They affect particularly the transport of gases and inflammable liquids in tank wagons. There are also new rules about the handling of peroxides. The full title of the document is the International Convention concerning the Carriage of Goods by Rail: Annex 1: Second Edition, 1958 (H.M. Stationery Office, price 10s.).

Single Traffic Authority for London

In the House of Commons last week the Minister of Transport was asked whether, in view of the evidence given to the Royal Commission on the reform of London government proposing a single authority to regulate London traffic, he would set up such an authority to facilitate the flow of traffic. Mr. Watkinson said that the setting up of such an authority to regulate London traffic would require extensive new legislation which would be bound to impinge in many respects on the matters now being considered by the Royal Commission on Local Government in Greater London. The Government therefore proposed to await the Royal Commission's report.

M. and G.N. Redundancy Absorbed

Some 750 men employed on the 180-mile Midland and Great Northern Railway line, which is to close in February, were this week to receive redundancy notices. A large proportion of the men will have the opportunity of taking up alternative posts on other stations in the Eastern Region.

Spring Clean for New York Subway

Four machines to be used for cleaning tunnels on the subway system are to be acquired by the New York City Transit Authority. This operation will consist of spraying the walls with a strong solution of detergent. It is estimated that to cover all the ground will take about 12 months.

Western Region Stations Closing

It is understood that passenger train services on the Western Region Moretonhampstead branch are shortly to be withdrawn and that the Western Region is seeking approval for the withdrawal of passenger trains from Plympton and Wrangaton stations and the intervening stations.

New Ministry of Transport Building

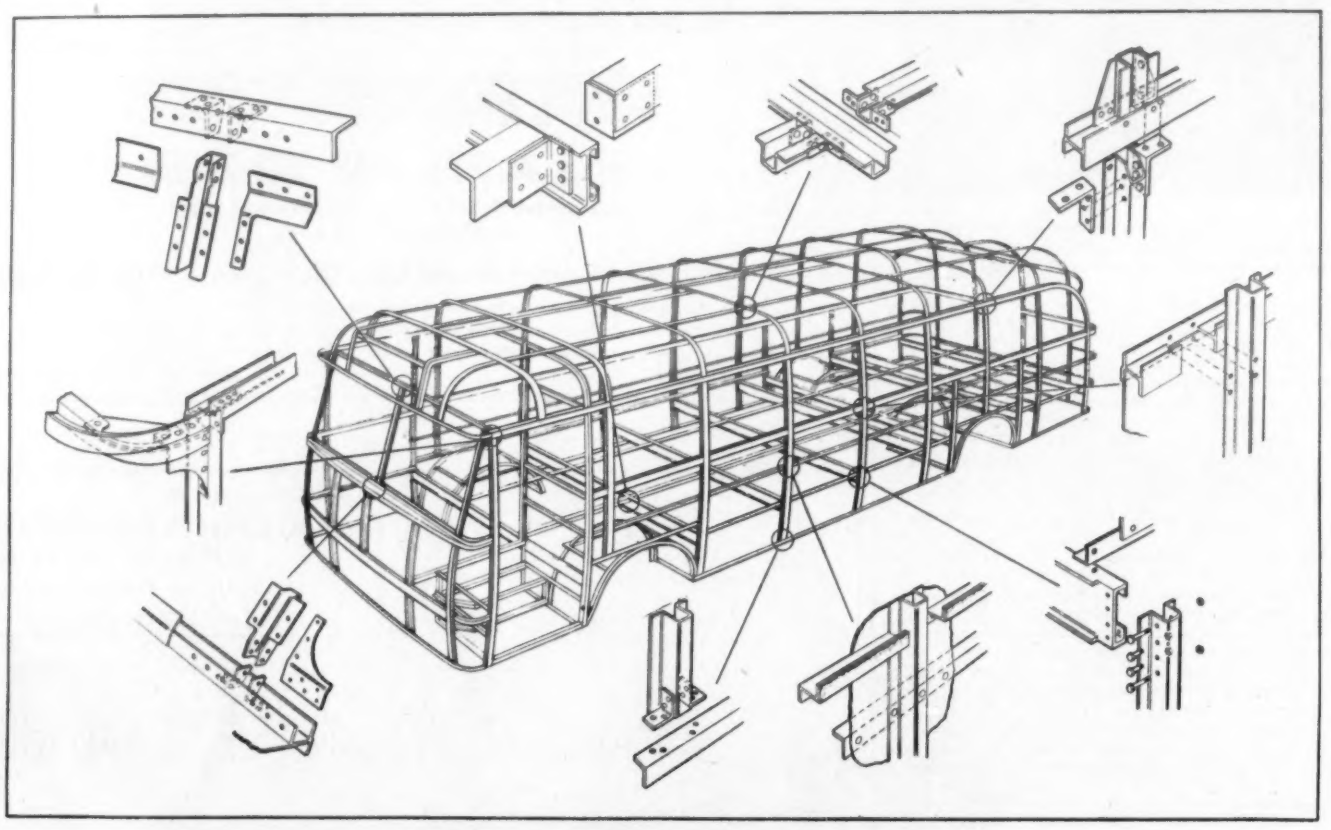
An 18-storey building containing some 800,000 sq. ft. of office space is now being completed for occupation by the Ministry of Transport and Civil Aviation in Southwark Street, London. Claimed to be the largest building erected in Britain since the war, it is due for completion within two years and will replace the present Berkeley Square headquarters, which were originally intended to be an hotel.

Decimal Currency in South Africa

Despite opposition from some commercial interests the South African Minister of Finance has announced that South Africa is to introduce the decimal coinage system, probably early in 1961. The necessary legislation, he said, would be introduced next year and preparations for the changeover would begin immediately. It is assumed that republican symbols will replace the Queen's head. The Minister added that the Government hoped to announce soon a decision on compensation to owners of machines which had to be converted or replaced.

Catterick By-Pass Work

Good progress is being made on the 3½-mile long £1 million Catterick by-pass, the Ministry of Transport reports. This is one of the schemes for modernising the Great North Road. Constructional work on the by-pass started immediately after Easter. With the use of up-to-date mechanical equipment, excavation work for more than half the total of 400,000 cu. yd. of excavation needed is now nearly complete in spite of bad weather conditions. Between terminal roundabouts the by-pass will be carried over or under all other road crossings. The line of the route of the by-pass crosses the site of the Roman fortified town of Cataractonium on the south bank of the River Swale, where the road will run in a deep cutting and the ancient monuments branch of the Ministry of Works is being afforded every facility to excavate and record the archaeological remains before road works are commenced.



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COMMERCIAL AVIATION

Cars to Northern Ireland

FUTURE OF NUTTS CORNER

FROM December 16, new Vauxhall cars sold in Northern Ireland have been delivered from the factory at Luton by air. Initially, there is one flight on Mondays to Fridays from Luton Airport to Belfast (Nutts Corner), leaving Luton at 10 a.m. The Bristol Freighter aircraft used carries either three Vauxhall Victors or two Velox or Cresta models, plus approximately 4,000 lb. of spare parts and literature, and one passenger. The Mayor of Luton (Alderman Mrs. M. F. Brash, J.P.), with Vauxhall directors, was at Luton Airport for the start of the service, and officials of the airport, the operating airline, B.K.S. Air Transport and Vauxhall Motors, Limited, welcomed the first flight into Nutts Corner at noon. The return flights are used for contract cargo from Belfast to Southend. Full use of the Bristol Freighter's capacity is made by carrying the cars on a platform above cabin-floor level. The intermediate space is loaded with Vauxhall spare parts. The scheme will be reviewed after two months' operation and future developments planned accordingly. Present indications are that Vauxhall will move all its 1959 cars and spare parts stock to Northern Ireland by this new method, using one aircraft only. The cost, it is stated, compares very favourably with that of transport by land and sea. The Vauxhall Northern Ireland sales, parts and service depot, located on the airport at Nutts Corner, was opened in 1956.

B.O.A.C. Resumes Services to Tripoli

B.O.A.C. resumed operations to Tripoli on December 9. Two Stratocruiser services in each direction on the London—Lagos route call weekly at Tripoli. Runways and other facilities at Tripoli Airport have been strengthened and modernised.

Ethiopian Full Member of I.A.T.A.

Ethiopian Airlines will become an active member of the International Air Transport Association on January 1. Admission of Ethiopian Airlines brings members of the association to 87, of which 79 are active and eight associate members.

P.A.A. Stratocruisers to Auckland?

Pan American Airways has applied to the New Zealand Air Department for permission to fly a Boeing Stratocruiser into Auckland three times a week to replace its DC4. The latter has been flying into Auckland from Nandi, Fiji, since May, 1953. It replaced a Stratocruiser which operated over the route for two years, but was finally taken off for economic reasons. Mr. B. R. Rae, the Air Secretary, said he could give no indication when a decision would be made on the Pan American application. An application by Canadian Pacific Airlines to fly a larger plane to New Zealand—a Britannia, instead of a DC6B—has been refused by the Government, on the ground that there is insufficient traffic for a Britannia.

Aer Lingus Christmas Fare Reductions

Aer Lingus has arranged special facilities for those who wish to fly over from Ireland and spend Christmas with the Irish residents in Britain. The airline is making available on selected days return trips at single fares from Dublin to six British cities. Return trips for the cost of a single ticket will be available from Dublin to Birmingham, Bristol, Cardiff, Liverpool, London and Manchester. The special fares will be available for travel from December 20 to 24 for outward traffic from Dublin and for return from December 26 to 31. Tickets will be valid for eight days. An example of the reduction is that a Dublin—London return will cost £8 6s. at the special rate as against the normal return fare of £14 19s.

Viscounts Predominate in Europe

Vickers Viscounts in the summer of 1958 carried 34 per cent of the entire intra-European air traffic. This made the Viscount, by a margin of 12 per cent, the predominant aircraft in passenger service in Europe. Figures issued by the Air Research Bureau show that on intra-European routes international passenger traffic increased by 8 per cent in the second quarter of 1958 compared with 1957, while capacity increased by 20 per cent. As a result, load factors dropped from 62.1 to 55.9 per cent. Freight traffic, however, increased by 13 per cent. The passenger traffic was divided between main aircraft types as under:

Viscount 700	17 per cent
Viscount 800	17 „ „
Total Viscount	34 „ „
Convair 340 and Metropolitan	22 „ „
DC6B	12 „ „

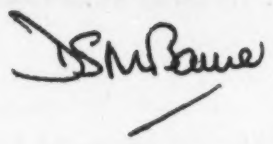
Future of Nutts Corner

The Northern Ireland Aviation Advisory Council met last week in Belfast and recommended that the Ministry of Transport and Civil Aviation should take another look around the other airports in Northern Ireland near Belfast and reconsider its decision to retain Nutts Corner as the civil airport for the province. Mr. A. H. Millward, chief executive of British European Airways, said after the meeting: "Before plans are made and money spent on the new buildings at Nutts Corner, the council feels that the Ministry should be asked to look again at any other alternative. Nutts Corner can never be an international airport for the big jets of the future, and the council has taken this decision because it feels that Northern Ireland should have an international airport." Aldergrove R.A.F. station, Mr. Milward went on, was the only aerodrome of which he could think with the necessary potentialities.

Southampton Water Aerodrome

Now that Aquila Airways has ceased its operations from Southampton, the question of the Southampton Water aerodrome licence has been considered by Southampton Harbour Board. The Ministry of Transport has informed the Board that it would not seem desirable to maintain the full facilities of a licensed marine aerodrome. Such foreign marine aircraft that might wish to use Southampton Water in the foreseeable future were likely to be private or charter aircraft for which the facilities of a licensed aerodrome were not at present required. The Ministry added that it presumed the board would be prepared to allow such use from time to time, as well as that by occasional military marine aircraft on official visits. It would not wish to see any development in the vicinity of the present licensed area which would preclude relicensing at a later date if it was desirable. The board has now agreed that the licence should be allowed to lapse, but has added that it might wish the area to be relicensed in the event of it being required at some future date.

B.T.C. ADMINISTRATION



Mr. D. S. M. BARRIE, M.B.E., M.J.I., A.M.Inst.T.

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When, last summer, the general duties branch of the British Transport Commission was absorbed in the secretary-general's office, as recorded in MODERN TRANSPORT at the time, the appointment was announced of Mr. Derek Stiven Maxwelton Barrie, then chief public relations officer, as assistant secretary-general. Born at Newport (Mon.) in August, 1907, and educated at Tonbridge School, he entered the service of the London Midland and Scottish Railway in 1932, after eight years' experience on the staffs of various national and provincial newspapers. From 1941 to 1946 he served with the Royal Engineers at home and overseas, latterly with the temporary rank of lieutenant-colonel. His war service was recognised by conferment of the M.B.E. and of the United States Bronze Star Medal. Returning to L.M.S.R. service, he was appointed assistant advertising and publicity officer and in 1948 he became public relations officer to the Railway Executive. Five years later he took up a similar post with the British Transport Commission and in 1956 he was made chief public relations officer. He was chairman of the British Railways public relations committee from 1948 to 1953 and had been chairman of the public relations and publicity committee of the B.T.C. since 1956. An associate member of the Institute of Transport, Mr. Barrie was elected to the council in 1956 and is chairman of the Visual Aids Committee. He is a member of the Institute of Journalists and a vice-president of the Railway Club, and has written, lectured and broadcast extensively on transport subjects.

IN PARLIAMENT

Railway Finances Debated

MODERNISATION REVIEW

MOVING the second reading of the Transport (Borrowing Powers) Bill in the Commons on December 11, MR. H. WATKINSON, Minister of Transport, pointed out that the £600 million which the Bill authorised the British Transport Commission to borrow was in effect authorised in 1954, when the Government said it would back the original railway modernisation plan. It was the second half of the money then promised. The railways, he said, were not given a large share of national investment in the years following the war. In those years the House had debated nationalisation, when it should have been discussing modernisation. Those years, from the point of view of modernisation, were utterly and completely wasted and had made catching up with modern forms of transport more difficult.

The Commission had got from the Government all that it could use in investment for this year and next year. Any claim that the Government was not backing to the hilt this plan was not founded on facts. The Government was backing the plan to the hilt, but because of the lateness at which it was started—and there was no imputation of blame—it would be a difficult race.

Passenger Receipts Show up Well

On the passenger side receipts were more than holding their own. For example—where modern passenger equipment was in use—on the Bradford—Leeds—Harrogate service annual receipts had increased from £23,000 under steam operation to no less than £116,000 under diesel multiple-unit operation; the Newcastle—Middlesbrough service had turned a deficit of £10,000 in movement costs in 1955 to a surplus of £137,000 in 1958. The first inter-city diesel service between Edinburgh and Glasgow carried 700,000 extra passengers in the first year of operation.

On the freight side the position was different and, quite frankly, difficult. Receipts had been sagging heavily throughout the year. In the first 44 weeks of this year the merchandise traffic was 14 per cent lower than last year, and 10 per cent down on 1956, which was a more comparable year. It was mainly in heavy traffic, coal and steel in particular. But by the end of the year fitted freight trains would have increased to 35 per cent of the whole, the number of wagons fitted with continuous brakes would have risen to 270,000; 44,000 containers suitable for door-to-door carriage would be in use; 150 older marshalling yards would be closed, and 27 new yards constructed under immediate plans.

Coal Transfer from Road to Rail

An agreement had been recently signed between the railways and the Electricity Generating Board which meant that about three to four million tons of coal traffic would be regained by the railways in the next six to 12 months, and more in succeeding years, a useful attempt to get coal back from road to rail. At the moment the amount of coal carried by the railways was down by no less than 500,000 tons each week.

In the circumstances it was necessary to look at the modernisation plan and its financial implications again to see whether what was being done was right. He would not have brought the Bill forward without looking again at that plan in the conditions of the next few years. At his request the B.T.C. had already initiated a full, detailed, and urgent review of the whole plan. It would take account of present and likely changes in traffic and try to reassess the level of activity in the coal industry in particular, because of the development of oil, and the high price of coal, and future developments in atomic power.

The terms of reference were:

To take account of the achievements under the modernisation plan up to the end of 1958, and the benefits obtained from it.

To make a detailed re-examination of the future course of the plan, with particular reference to the next five years related to the future size of the railway system needed in view of current economic developments and future expected requirements.

A re-appraisal of the economics of modernisation in the light of the above, and the steps necessary to achieve the earliest possible break-even date based on an actual assessment of future traffic costs and economies.

The Government would have to receive complete economic justification for any change in the target break-even date, 1961-62.

First Things First

The Commission realised that much could be done now without waiting for the reappraisal and was going on immediately with two lines of attack. One was more modernisation on a narrower front, the other more savings on a much broader front. On main-line electrification the Commission proposed for the moment to concentrate resources on the London Midland line to Manchester and Liverpool, and hoped to accelerate its completion by several years so as to get a quicker return on the capital invested. There was to be an acceleration in the introduction of diesel locomotives, particularly on the railway route north of Newcastle, to eliminate the use of steam on an area basis as quickly as possible. By 1961 nearly 1,100 would be in service. Electrification in process in other areas would not be stopped. The B.T.C. had been asked to increase its target for additional economies in 1959 from £20 million to £30 million.

The new freedom in freight charging was being used to the best effect subject to the conditions of the market. At the moment the Commission had an application before the Transport Tribunal dealing with passenger fares. It was for increased headroom, the purpose being to allow of a more flexible fares policy. For example, some luxury trains like the new *Master Cutler*, which was such a great success, might well justify a higher fare than standard. The railways had thought of seeing if higher fares would keep branch lines going—if the customers would pay. There would be no overall increase in either season or ordinary fares effective within the next six months.

Fare Discrimination in London?

The new London Travel Committee was having its first meeting that day. One of the things it was to study was whether peak hour travel could be spread and more efficient use made of public transport, encouraged by a fare differential.

The area boards, with their link with the Commission through their chairmen, were doing "a first-class job." They were getting much nearer to their customers by the decentralisation now going on within the regions. They were giving for the first time the kind of personal service that most people thought a nationalised industry could not ever give at all. The Government considered that

(*Continued on page* 11)

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WORKS ENTRANCE WITH BUS STATION

Level Crossing Replaced

IMPROVED facilities for road traffic, both buses and lorries, serving the vast I.C.I. factory at Billingham, Co. Durham, have resulted from the construction of a new East Gate entrance and bus station at this point. This makes the East Gate the principal commercial gateway of the factory; less use will now be made of some of the narrower roads inside the factory and by diverting to the East Gate much of the traffic which formerly used the other two factory entrances, the heavy traffic through the built-up areas of Billingham village will be reduced. It also provides an excellent connection between the factory and its new road transport depot which has also been completed recently on a nearby site. The I.C.I. factory at Billingham, which is probably the largest integrated chemical factory in the British Commonwealth, covers an area of about 1,100 acres and employs about 17,000 people in five I.C.I. divisions.

New East Gate entrance and bus station at I.C.I. Billingham works

The East Gate, on the Stockton—Haverton Hill road (A1046), was originally available only to pedestrians and cyclists and comprised a subway under the railway tracks which encircle the factory perimeter. During the war an emergency level crossing for road vehicles over these rail tracks was provided and later this was converted into a proper vehicle level crossing fitted with road gates and traffic lights. The general rapid growth of road transport, together with the limited improvements in recent years to road A1046, which made it a main road between the factory and Middlesbrough and Stockton, combined to make the level crossing more and more of a restriction to road traffic.

As long ago as 1955 it was found that in a normal day the stoppages totalled more than three hours. An average of more than 1,500 road motor vehicles, was using the gate every day; on the peak day it was 2,200 vehicles. Traffic congestion was always worst when "day men" were leaving the factory at 4.30 p.m. and boarding the special buses in the narrow winding roadway outside the gate. There was a very great risk of serious accident to pedestrians and cyclists and to minimise the danger the level clossing had to be closed to motor traffic from 4.30 to 4.45 p.m. daily.

Recently Durham County Council decided to straighten the loop in the A1046 road outside the gate and I.C.I. engineers arranged at the same time to build a two-span bridge across the factory rail tracks to replace the level crossing. The bus station is a major feature of the scheme. It is constructed on made-up ground, the new road cut-off being at a higher level than the old. A total of 26 buses unload or pick up at the peak period at this gate and the bus station, with islands and shelters, is within the confines of a large triangular area between the gate itself and the new public road. At the sides of the bus station area there are incoming and outgoing roadways for normal road traffic, together with a lay-by with a checkpoint for incoming lorries, and a new road weighbridge which will reduce the congestion at the other road weighbridges in the factory. The new bridge inside the gate has a 30-ft. carriageway.

BOOK NOTICES

Christmas Reading

ON THE OLD LINES. By Peter Allen. (London: Cleaver-Hume Press, Limited, 31 Wright's Lane, W.8. Price 25s.) The original edition of this book sold out in a matter of weeks; here is a fascinatingly enlarged second edition on better paper and with more pictures from Africa and Mexico. Railway enthusiasts are indeed fortunate that the author's job takes him and his camera into such attractive spots from the railwayac's viewpoint. The African postscript reveals the fulfilment of an ambition to travel on South Africa's *Blue Train*.

* * *

THE LOCOMOTIVES OF THE GREAT WESTERN RAILWAY—PART 5: SIX-COUPLED TANK ENGINES. (Birmingham, 14: Railway Correspondence and Travel Society—Mr. T. J. Edgington, Hon. Publications Officer—57 Heathfield Road, Kings Heath. Price 15s.) Another book in the excellent R.C.T.S. series becomes available this year; this volume deals with 2,600 engines, although the standard 2-6-2 tank classes are omitted as they will fall to be dealt with in Part 9, which deals with standard two-cylinder classes. There is the usual detailed information, a number of diagrams and some 120 illustrations of various types. A handsome colour plate from a painting by H. M. Le Fleming of 0-6-0 pannier and saddle tanks about 1927 serves as frontispiece.

* * *

THE RAILWAY MAGAZINE MISCELLANY. Edited by Henry Maxwell. (London: George Allen and Unwin, Limited, 40 Museum Street, W.C.1. Price 30s.) For the student of railways as an institution the *Railway Magazine* has served as a handbook—or perhaps a Bible—since its foundation in 1897. Unfortunately, few among householders can find room for over 60 years of such volumes, even if they were easy to come by. Mr. Maxwell and his publishers have therefore done well by the would-be reader of past issues by producing such a miscellany as this. No long articles are reproduced but there is a piquant selection of minor items of news and comment, with a clever series of illustrations. The anthology ceases in 1919, when the Editor appears to feel that the railways of Britain had seen their finest hour—but "left to themselves they would undoubtedly have won through in the end."

* * *

BRITISH NARROW GAUGE RAILWAYS. By Richard Bagnold Jones. (London: A. and C. Black, Limited, 4-6 Soho Square, W.1. Price 18s. net.) The author has produced a compendious record of certain narrow-gauge railways in Britain, ranging from the 15-in. gauge Romney, Hythe and Dymchurch, and Ravenglass and Eskdale Railways to the 4-ft. gauge Glasgow Underground. Among lines now closed are the Lynton and Barnstaple, Corris and Glyn Valley, together with the Welshpool and Llanfair. The Isle of Man receives attention together with the Festiniog and Talyllyn revivals. The Snowdon Mountain Tramroad is to be expected, but for good measure the Padern mineral line's activities are included. The author's illustrations are fresh and original; his style is factual, almost at times to the point of dryness, but he makes shrewd points, such as the lack of covered coaches on the Ravenglass and Eskdale, despite the absence of dryness from the Cumberland weather.

A pneumatically operated paint sprayer capable of spraying 120 oil drums an hour has been installed at the Wandsworth works of the Mobil Oil Co., Limited. The machine is automatic in operation; it saves both paint and labour and is said to give the drums a far better finish than hand painting. Design and construction were by the Hymatic Engineering Co., Limited, Redditch, Worcs, in association with Alfred Bullows and Sons, Limited, Walsall, Staffs.

ALUMINIUM BID

Tube Investments Offer

THIS week about 14,000 stockholders of the British Aluminium Co., Limited, received a direct offer to purchase their stock made jointly by Tube Investments, Limited, the £100 million Birmingham engineering enterprise, and Reynolds Metals Company, which is the second largest aluminium interest in the United States. Tube Investments and Reynolds are associated in a British company, Reynolds T.I. Aluminium, Limited, which was formed late in 1957 and is now one of the three biggest United Kingdom producers of wrought aluminium.

Both American and British parent companies started activities in 1919, Reynolds Metals from the outset concentrating on aluminium. Today it has assets of over £262 million and owns four bauxite mines, eight aluminium reduction plants and 24 aluminium fabrication plants. With a production capacity of at least 600,000 short tons of virgin aluminium a year, Reynolds Metals is the third largest producer in the world. Tube Investments first engaged in the production of precision tubes in various metals, of which it is currently the largest producer in the world, and electrical equipment and cycles. It entered the aluminium industry in the mid 1930s. It now has 50 subsidiary companies, employing 40,000 people in Britain.

The T.I.-Reynolds offer is well above the price at which the British Aluminium board had originally arranged to sell 4½ million shares to Aluminium Company of America (Alcoa). It has been said that the proposed Alcoa deal would be disposing of only one-third of the shares to American interests and that this would leave control in British hands. This is not necessarily so as it takes no account of the fact that a 33⅓ per cent holding often represents effective control when the remaining shares are in widespread small holdings, nor of the number of B.A. shares already held by Alcoa and those it might purchase in the future. On the other hand, finance for the T.I.-Reynolds offer would be arranged so that equity holdings and voting rights remained 51 per cent with T.I. and 49 per cent with Reynolds, thus maintaining British control. Both proposals require Treasury consent.

TRANSPORT DEBATE

(*Continued from page 9*)

the process of decentralisation could go on, and if old loyalties were revived, if closer contacts were achieved, he saw nothing wrong with that.

A somewhat negative approach was discernible in MR. ERNEST DAVIES, who led the Opposition reply. It was going to be impossible, he said, for the Commission to repay this loan which had now been made to meet its deficits, however efficient it became and however many economies were made. It would be more politically honest for the Minister and financially more prudent if he admitted that deficit financing on this scale was a disguised subsidy.

MR. J. PEYTON (chairman of the Conservative Parliamentary transport committee) said that if the railways were to be a commercial undertaking then, despite all constituency aches and pains, it had to be accepted that the Commission was entitled to freedom.

* * *

In written answers the Minister of Transport stated that the total of B.T.C. capital investment for 1959 will be rather more than £200 million and that the Commission proposes to allocate well over £170 million of this to the railways.

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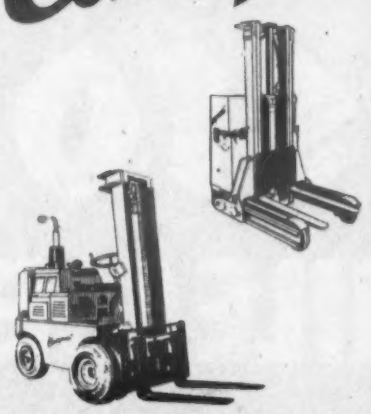

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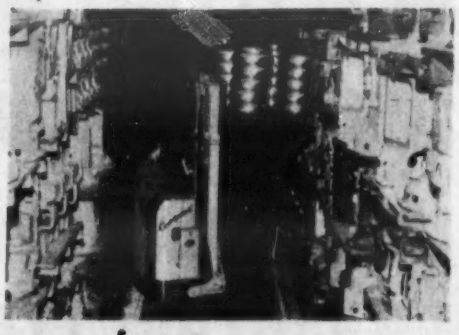

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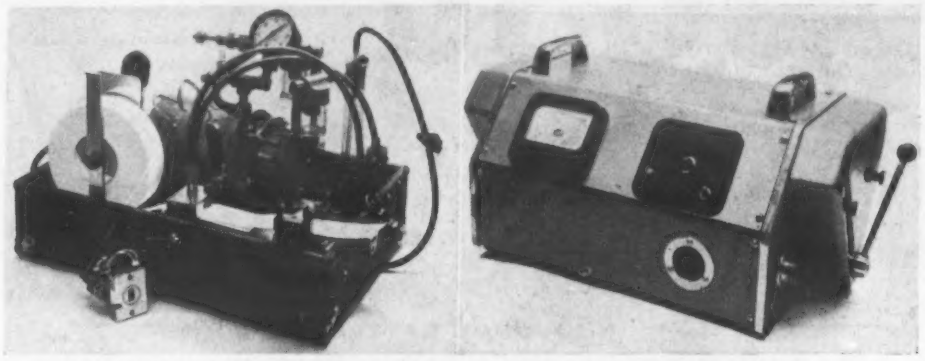
ROAD VEHICLE ENGINE FUMES

Their Control and Measurement

*By A. T. WILFORD, B.Sc., A.R.C.S., F.R.I.C., C.I.Mech.E., F.Inst.Pet., Director of Research, London Transport Executive**

SINCE the end of the 1939-45 war, there has been a rapid growth in the use of compression-ignition (or diesel) engines in place of spark-ignition (or petrol) engines in road vehicles in Great Britain and Europe. The use of diesel engines has given rise to some adverse criticism for the reason that if badly maintained or improperly operated, dark smoke is likely to be emitted from the exhaust. The problem is one that was foreseen by those who pioneered the development and application of diesel engines to road vehicles. The former London General Omnibus Company (subsequently taken over by the London Passenger Transport Board, which itself has now been replaced by the London Transport Executive) was amongst the first in this field and was fully aware that a clean exhaust was an essential requirement if diesel-engined buses were to be acceptable to passengers and to the public at large. Stringent precautions, which have been extended and improved upon over the years were therefore introduced from the very start, with the result that, as generally recognised, London's diesel-engined buses and coaches, of which there are some 7,800 in all, compare favourably with those elsewhere in regard to exhaust cleanliness.



The Van Brand and (right) Hartridge-B.P. smoke meters referred to in the text

Air Pollution

In Great Britain public reaction against black smoke from diesel-engined vehicles was sharpened by the disastrous London "smog" of December, 1952. There were some who went so far as to suggest that diesel-engined vehicles were a major source of atmospheric pollution, in total disregard of the odorous and toxic, though usually invisible fumes emitted by petrol engines, and of the estimated 2.1 million tons of smoke discharged annually to the atmosphere of Great Britain as a result of the combustion of solid fuels (mainly coal). The consumption in the United Kingdom of diesel oil for road vehicles during 1957 was no more than 1.79 million tons, when the total consumption of motor spirit was 5.74 million tons, the amount being considerably less than expectation due to the imposition of fuel rationing due to the Suez crisis.

These references to air pollution arising from combustion of coal and from the invisible but by no means harmless fumes emitted from petrol engines are made not as an apology for the diesel engine, which if properly maintained and operated, has nothing to be ashamed of, but to place the problem of exhaust fumes emission in its proper perspective and to emphasise that it is by no means confined to diesel engines. Control and measurement of fumes emitted from petrol-engined vehicles is at least as necessary as in the case of diesel-engined vehicles and in view of the predominance of the former type of vehicle, is of even greater importance. The notorious eye-irritating smog of Los Angeles is largely attributable to the great number of private motor cars operated in that area, the number of diesel-engined vehicles in use being almost insignificant.

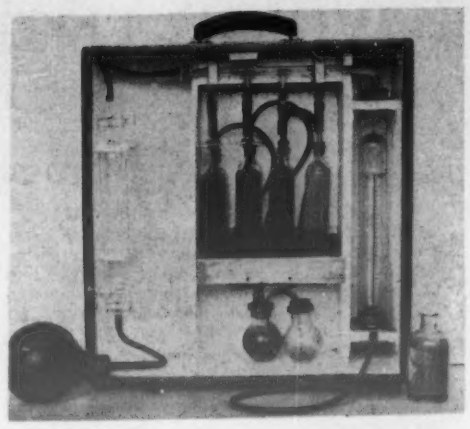
Carbon Monoxide

In a report dealing with the smog problem in Los Angeles, the Stanford Research Institute states that the average petrol engine discharges about 7 per cent of its fuel intake in the form of unburnt hydrocarbons. It is also well known that to achieve optimum power output with a petrol engine, it is necessary to employ an over-rich fuel-air mixture, that is a mixture in which the proportion of fuel is in excess of the amount of air necessary to ensure complete combustion; the exhaust gases, therefore, must inevitably contain a considerable proportion of the toxic gas carbon monoxide. Even with weak mixtures the exhaust gases will contain carbon monoxide if distribution to the cylinders is unsatisfactory. A diesel engine operated at the manufacturer's rated output, with exhaust smoke at the maximum permissible level—a level at which there will be no adverse criticism from the public—is discharging only 2 per cent of its fuel intake in the form of unburnt hydrocarbons. Moreover, the exhaust gases will contain only very small amounts of carbon monoxide. Analyses of exhaust gas samples from London Transport buses operating in service have shown carbon monoxide contents to vary between nil and 0.066 per cent, with one extreme sample yielding 0.15 per cent. These vehicles, which were a random selection, could easily comply with the regulations applying to the use of diesel-engined locomotives in coal mines, which require that the exhaust gases shall contain not more than 0.2 per cent of carbon monoxide. It is not perhaps generally known, however, that a diesel engine which is allowed to emit dense black smoke may be discharging exhaust gases containing more than 7 per cent of carbon monoxide.

Combustion Control

Even under conditions of perfect combustion, if such could be achieved, internal combustion engines must lead to pollution of the atmosphere by carbon dioxide, sulphur gases and oxides of nitrogen, but this is a situation which has to be accepted. The operator and the public at large are concerned rather with conditions which arise as a result of incomplete and inefficient combustion, leading to the production of objectionable and, certainly in the case of the petrol engine, toxic exhaust fumes. Such fumes are invariably indicative of a wasteful use of fuel and apart altogether from public amenity there is an incentive for vehicle operators to take steps to minimise the nuisance as a means for effecting economy in fuel consumption.

A system of fuel economy control of road vehicles has been in operation in London Transport for the past 30 years or more. It was originally introduced when the fleet was entirely composed of petrol-engined vehicles and was subsequently adapted to apply also to diesel engines. Technical control of combustion of fuel in petrol-engined vehicles can be effected by adopting carburetter settings appropriate to each type of engine operated, which implies a considerable degree of standardisation, and the rigorous adoption of a carburetter setting based upon the performance expected from engines in good mechanical condition; this is inherently advantageous since it prevents the practice of temporarily rectifying, though in reality only masking, engine defects by increasing the size of the carburetter jets. The method employed by the former London General Omnibus Company made it possible to meet service requirements and at the same time ensure that when the engines were operating at full load, the exhaust gas emission contained no more than 2½ to 3 per cent of carbon monoxide—low in comparison with general practice—nor were lachrymatory fumes emitted when the engines were idling.



Portable gas analysis apparatus for carbon dioxide, free oxygen and carbon monoxide

The exhaust gas analysis equipment employed in conjunction with the standardisation was the well-known Orsat type, modified so as to render it portable. The various component parts—measuring cylinder, absorption tubes, etc.—also the exhaust gas sampling tubes were themselves standardised, thus facilitating any necessary repairs and replacements. The apparatus was used for determining the proportions of carbon dioxide (CO_2), free oxygen (O_2) and carbon monoxide (CO) in the exhaust gases to the nearest 0.1 per cent. The solutions employed in the absorption vessels can be obtained from standard text books on gas analysis. The diesel engine operating under normal conditions utilises a mixture in which there is a large excess of air and under these conditions power output and the proportion of carbon dioxide in the exhaust gases are directly related to one another; carbon monoxide is virtually absent. It is thus possible to apply exhaust gas analysis to routine control of combustion in diesel engines merely by determining the proportion of carbon dioxide in the exhaust emission. This permits the use of a much smaller apparatus in which there is essentially only a measuring cylinder and one absorption tube.

Exhaust Samples

At one time, all engines in London Transport's fleet, whether petrol or diesel type, were fitted with a sampling point on the exhaust manifold, the connection being closed by a blank nut when not in use. Experience has shown that for routine testing it is permissible to obtain samples from the exhaust tailpipe. The method employs a 1-in. bore tube 12 in. in length inserted into the exhaust tailpipe. The other end is connected to suitable lengths of copper and rubber tubing which can be conducted through an open window thus enabling samples to be taken while the vehicle is running on the road.

In the early days of the replacement of petrol-engined by diesel-engined buses and before any equipment for testing and setting of fuel-injection pumps was available, it was the practice to adjust the pumps to give the appropriate delivery of fuel on the basis of the CO_2 content of the exhaust gases. Now that both the central overhaul works and garages responsible for fuel-injection pump

(*Continued on page* 14)

* Abstract of a paper presented to the International Conference on Technical Inspection of Motor Vehicles, in Brussels in September.

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THE DUAL-PURPOSE REAR-WHEEL TRACTION TYRE with all the features you're demanding

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Be it on main roads, by-roads, or no roads the Super Mileage Lug tyre's cross grooves, heavy shoulder lugs and circumferential ribbing will combine to give maximum bite and traction and long safe wear. The dual-purpose Super Mileage Lug helps reduce mechanical maintenance too. Many so-called dual-purpose tyres slip and spin causing undue strain on engines and transmissions. But with the POWER BITE TRACTION of the Super Mileage Lug, this profit-draining problem is practically eliminated.

MORE SKID DEPTH
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DRIVE SAFELY

OUTPULLS AND OUTLASTS any tyre of its kind.
Specially designed for on-and-off-the-road service where a large part of the work is off-the-road and particularly severe.

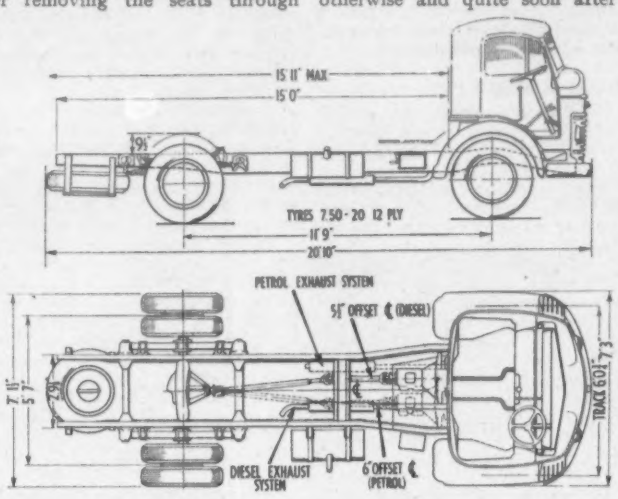
EXPERIENCE COUNTS *44 Factories throughout the world. Firestone total sales exceed £1,000,000 per day.*

COMMERCIAL VEHICLE TEST

*Commer Forward-Control 6-Ton Diesel Lorry**

COMFORTABLE, QUIET AND A GOOD WORKER

IN a recent hard day's work over our standard test route on the hilly Kent and Surrey borders, the new Commer underfloor diesel-engined forward-control 6-ton lorry—official designation HPX641—proved itself a solid vehicle, comfortable and quiet to drive, and a good worker. The new Rootes medium diesel engine—the Perkins six-cylinder indirect-injection C305—with its nearly horizontal cylinder block tucks away neatly under the cab but is nevertheless quickly accessible for maintenance after removing the seats through hinged covers. The layout is an excellent one from the point of view of providing maximum space in a forward-control cab which, without the intrusion of the normal engine cowling, has spacious accommodation for three adults.



Drawing showing layout and principal dimensions of the Commer underfloor-engined forward-control 6-ton chassis

Improved Cab

The recently remodelled Commer cab, produced by British Light Steel Pressings, Limited, and now generally adopted for the Commer and Karrier forward-control ranges, shows improvement over the earlier design in a number of directions. Notably, there is now a large one-piece windscreen giving excellent vision, wider seat adjustment and more headroom. The wide solid steps ahead of the front wings, providing easy access through the wide front-hinged doors, and the relative positioning of the seats and front end so that the door pillars least obstruct the field of view have been retained. The cab is of all-steel construction and well insulated and is attached to the chassis by four rubber-insulated mountings; ventilation is provided by opening quarterlights and full-drop windows in the doors and adjustable front vents. Seating is very comfortable and good adjustment of the separate driver's seat is provided by three height positions and adjustable rake as well as a 7-in. fore-and-aft adjustment.

The Commer medium-capacity forward-control range and the new diesel engine were described at the time of their introduction in our issue for September 20. Briefly recapitulating, the 6-ton chassis is based on a pressed-steel channel-section frame of generous dimensions with six cross-members and has a wheelbase of 11 ft. 9 in., providing for a maximum body length of 15 ft. 11 in. The dimensions selected provide good manoeuvrability and the turning circle measured at the wheeltrack is only 51 ft. The use of reverse-camber semi-elliptic springs gives a low laden frame height of just over 2 ft. 7 in. when standard 7.50-20 12-ply tyres are fitted.

The Perkins C305 5-litre diesel engine of 87 b.h.p. at 2,400 r.p.m. and 208 lb./ft. torque at 1,300 r.p.m. is an alternative to the Commer 4.75-litre petrol engine, which produces 110 b.h.p. at 3,000 r.p.m. and 215 lb./ft. torque at 1,600 r.p.m. The diesel is notable for its incorporation of the C.A.V. DPA distributor-type fuel-injection pump and chromium-plated steel cylinder liners. Drive is through an 11-in. (petrol) or 12-in. (diesel) single dryplate clutch, four- or five-speed gearbox, two-piece balanced tubular shaft with needle roller bearing joints and rubber-mounted centre bearing and fully floating spiral bevel back axle. An Eaton two-speed axle is available optionally with either gearbox. Hydraulic brakes are operated through a Clayton Dewandre Hydrovac vacuum servo motor-case fitted with the simple hydraulic governor, which is the first production application of this unit on a six-cylinder engine. Good use has been made of the latitude permitted by the design of the distributor pump in the manipulation of injection characteristics and the C305 proveu a forceful performer with very good low-speed torque. Translated into figures, this gave average times to reach 20 m.p.h. and 30 m.p.h. from rest on fairly level road of 10.7 and 23.3 sec. respectively with the vehicle fully loaded.

With the higher (5.875 to 1) axle ratio, gears were well matched, giving a fully laden range from ability to restart on gradients steeper than 1 in 4¼ to a top speed of about 48 m.p.h. (representing a run up on the hydraulic governor of about 10 per cent). The four-speed gearbox appears adequate for normal operation but in particularly hilly districts the closer ratio spacing of the optional five-speed box would obviously be advantageous, while

(*Continued on page* 14)

reservoir and provide a total lining area of 438 sq. in. The diesel-engined chassis has a licensing weight of just over 2 tons 9 cwt. and the standard cab adds about 3½ cwt. As tested, completely equipped and filled for the road and fitted with the sturdy works-built 15 ft. 6 in. by 7 ft. dropside body, the vehicle weighed 3 tons 7½ cwt. The recommended maximum running weight is 9 tons 7 cwt.

First impressions of a vehicle for test usually indicate whether the day is to be pleasurable or otherwise and quite soon after taking over the Commer, despite the cold and foggy weather the effects of which inside the cab were nullified by the (optional) heater-demister, we were satisfied that our work that day was not to be less than very pleasant. In this we were not disappointed. The vehicle proved light to drive, with well-placed controls and very comfortable seats and we personally approved of the nearly vertical steering column which permitted a firm and natural hold on the steering wheel. The steering was particularly light and accurate with a helpful self-centring characteristic, features that, with the good vision, made for confident handling alike in the fairly heavy suburban traffic of south-west London and at higher speeds on open roads. Noise level in the cab was a good deal lower than in most forward-control diesel-engined vehicles of this weight.

Of the controls, the gear lever on the test vehicle was perhaps a little oversensitive to excessive side movement, so that it was possible to miss a change or have difficulty in selecting first gear when stationary until one became accustomed to it, and the engine stop control on the panel under the passenger seat is rather remote from the driver. Otherwise, all is harmonious. With the standard rear helper springs and without the optional front dampers the ride and stability of the loaded vehicle were generally very good.

Engine Performance

The C305 diesel engine is of course a recent development of the Perkins P-series design but embodying a number of changes apart from the nearly horizontal positioning of the cylinder block, larger bore size and Cromard cylinder liners. The most radical change is in the adoption of the new C.A.V. distributor-type fuel-injection pump, in this

TEST RESULTS AT A GLANCE

Vehicle Details

MAKER: Commer Cars, Limited, Luton, Beds.

TYPE: HPX641 forward-control 6-ton diesel lorry.

ENGINE: Perkins C305 underfloor diesel with C.A.V. DPA distributor fuel-injection pump; bore 3·6 in. (91·44 mm.), stroke 5 in. (127 mm.), capacity 305 cu. in. (5·003 litres); gross b.h.p. 87 at 2,400 r.p.m., torque 208 lb./ft. at 1,300 r.p.m.

TRANSMISSION: **Clutch,** single dryplate 12 in. (305 mm.) dia., 133 sq. in. (858 sq. cm.) lining area; **gearbox,** four speed with constant-mesh third, ratios 6·414, 3·366, 1·788 and 1 to 1 forward, 8·246 to 1 reverse; **driveshaft,** balanced open tubular Hardy Spicer with needle roller bearing joints; **rear axle,** spiral bevel gear with fully floating half shafts, ratio 5·857 to 1 standard. Five-speed constant-mesh gearbox and two-speed rear axle available at extra cost.

BRAKES: Two-leading-shoe hydraulic with Hydrovac assistance. Total lining area 438 sq. in. (2,826 sq. cm.).

TYRES: 7·50-20 12-ply, twin rear, standard.

WHEELBASE: 11 ft. 9 in. (3·58 m.).

WEIGHT: Chassis in licensing order 2 tons 9¼ cwt. (2,502 kg.); 15 ft. 6 in. dropside lorry complete in kerb trim 3 tons 7½ cwt. (3,429 kg.).

PRICE: Chassis and cab £1,170, dropside lorry complete £1,285, plus £253 16s. 4d. U.K. purchase tax in each case.

Test Results

ROUTE: MODERN TRANSPORT route in Kent and Surrey.

CONDITIONS: Cold and foggy.

RUNNING WEIGHT: 9 tons 4½ cwt. (9,373 kg.) plus crew of two.

PAYLOAD: 5 tons 17cwt. (5,943·8 kg.).

FUEL CONSUMPTION: Continuous running over 15-mile standard route 16·63 m.p.g. (5·88 km. per litre) at 29 m.p.h. (46 k.p.h.) average speed.

GROSS TON/M.P.G.: 155·5 (56 tonnes/km./litre).

PAYLOAD TON/M.P.G.: 97·3 (35 tonnes/km./litre).

MAXIMUM GRADIENT CLIMBED: 1 in 4¼ (22 per cent).

TURNING CIRCLE: 51 ft. (15·5 m.) wheeltrack.

ACCELERATION:

Averages of four runs, through gears
0-20 m.p.h. 10·7 sec.
0-30 m.p.h. 23·3 sec.
In top gear:
10-20 m.p.h. 10·5 sec.
10-30 m.p.h. 24 sec.

BRAKING: Average stopping distance on good surface from 30 m.p.h. in simulated emergency stops 51 ft. 3 in. (15·55 m.), equivalent to 18·9 ft. per sec. per sec. or 0·58 g. overall deceleration; Don meter 58-62 per cent. Handbrake from 20 m.p.h.: 38-40 per cent Don meter.

ESTIMATED TOP SPEED: 48 m.p.h. (77 k.p.h.).

OVERALL FUEL CONSUMPTION: For 137 miles of mainly hard driving including 30 miles in London suburbs and frequent stops 13·5 m.p.g. (478 km. per 100 litres).

The loaded vehicle got away easily and smoothly on this 22 per cent (1 in 4½) gradient; right, the attractive and functional new front end is well shown in this picture, which shows the test tank being filled for a fuel consumption run

* No. 457 in the MODERN TRANSPORT series of road tests.

"Chink in the Armour"

BARIMAR tackles a badly damaged tractor transmission case

Transmission case as received by Barimar

To look at the average tractor and excavator one would imagine it to be immune from all the ills that beset less robust machinery. So strong, so seemingly confident in its ability to "move mountains," the very idea of a breakdown seemed remote indeed. Yet, as with mortal man, the "chink in the armour" revealed itself, as the first picture shows. It is the transmission case of a tractor that came to grief, much to the dismay of the contractor. A giant earth mover was idle, work "held-up" and a mighty piece of machinery put "out of action." Barimar tackled the job with confidence, realising that something more than welding skill was demanded. Not only had the transmission case to be made whole again—it would need welding so that strength and permanence were assured. The transmission case after repair was exhaustively tested in the Barimar workshops, scrutinised for possible flaws and sent back to the contractor with the assurance that it would "stand up" to the job indefinitely. Not merely a verbal assurance, but the promise implicit in the Barimar Repair Tag, with its Money-back Guarantee. Accurate machining after welding is a recognised part of the Barimar Service—a Service to which engineers and industrialists pay constant tribute.

What a transformation! Repaired by Barimar under the Barimar Money-back Guarantee.

ALL BROKEN PARTS which are transportable must be sent CARRIAGE PAID. Please remove all fittings and post letter advising dispatch. When it's impossible to transport damaged machinery Barimar experts operate ON THE SPOT.

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MANCHESTER, 13: 67 Brunswick Street, Ardwick. *Telephone: Ardwick 2738*
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Most Breakages to Motor Parts can be Repaired by Barimar at a Big Saving on the cost of New Parts.

CYLINDER BLOCKS: Every kind of fracture, cracked water jackets, broken bores, scored bores, damaged stud housings, cracked, burnt, pitted and sunken valve seatings.

CYLINDER HEADS: Broken and cracked heads, cracked and worn valve seats, chipped, warped or damaged faces, broken rocker standards, defective camshaft bearing housings, cracked stud holes, stripped plug threads. IRON OR ALUMINIUM.

CRANKCASES: Fractures caused by broken connecting rods and run big ends, broken-off bearer arms, smashed sumps, cracked stud housings, broken bearing and flywheel housings, stripped drain-plug threads. IRON, ALUMINIUM OR ELEKTRON.

CRANKSHAFTS: Broken across web or journal, cracked, scored, threads stripped, splines or tapers worn.

TRANSMISSION: Cracked or broken gearbox and axle casings, damaged gear teeth, worn splines and tapers, fractured shafts, cracked differential casings.

THE WORLD'S SCIENTIFIC WELDERS

SILVER ROADWAYS LTD.

Reliable Trunk Services to all Parts

EXETER — Peamore Garages, Alphington — *KENNFORD 485*
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SALFORD CITY TRANSPORT

ANNUAL CONTRACTS

(*a*) Petrol, Paraffin, Fuel Oil, Lubricants, White Lead, Linseed Oil, Turpentine, Terebine, Brake Linings, Rope Yarn Waste, Cotton Wipers.

(*b*) Uniform Clothing (including waterproof clothing).

(*c*) Vehicle Livery Paints.

TENDERS ARE INVITED for supplies of the above items to the various Departments of the Corporation during the 12 months ending March 31, 1960.

Forms of Tender may be obtained on written application, from The General Manager and Engineer, Salford City Transport, Frederick Road, Salford, 6, Lancs.

Latest time for receipt of tenders is 9.30 a.m. on Wednesday, January 7, 1959.

R. RIBBLESDALE THORNTON,
Town Clerk.

JAMAICA OMNIBUS SERVICES

ASSISTANT TO THE SECRETARY/ACCOUNTANT

APPLICATIONS are invited for the position of Assistant to the Secretary/Accountant of Jamaica Omnibus Services, Limited, operating town services in Kingston, Jamaica. The Company has a fleet of 170 vehicles, staff of 1,000 and modern headquarters and office premises. The appointment will be for an initial term of three years and subject to renewal, will continue thereafter on a three-yearly basis.

The commencing salary will be dependent upon the qualifications and experience of the successful applicant but will not be less than £1,500 per annum (inclusive of an overseas allowance of £300 per annum). In addition, a rent free house will be provided for a married man, or an additional allowance of £300 per annum for a single man. Passages will be paid to Jamaica for the successful applicant and family, and three months' home leave will be allowed on completion of three years' service, with paid passages for the Officer and his wife.

Candidates should preferably be between 30 and 40 years of age and must possess experience in accounting and administration and must have the ability to supervise and control an office staff of some 50/60 persons.

Candidates should give particulars of age, qualification, experience and present salary, and should indicate the earliest date when they could leave for Jamaica. Married applicants should state the number and ages of children. Applications to the Secretary, The British Electric Traction Co., Limited, Stratton House, Piccadilly, London, W.1, not later than January 5, 1959.

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SPECIALIST PRODUCTS IN CY REGD.
ABRASION-RESISTING ALLOY

LOCO BRAKE BLOCK LIFE extended from 3 months to 2½ years

This is typical of the extra service being obtained from our CY Alloy Brake Blocks—which although remarkably resistant to wear, have no adverse effect on loco tyres. This is one of our most popular applications. After exhaustive tests many of the best known manufacturers of locomotives fit Cy brake blocks as standard.

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Tel.: Lutterworth 10, 60 & 152
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Road Vehicle Engine Fumes

(*Continued from page 12*)

maintenance are equipped with testing machines, the gas analysis method is seldom employed for setting of fuel pumps, though exhaust gas sampling continues to be used as a rapid means for spot checking. Samples are taken at random by the research department's inspectors from a number of buses each week and any deviation from the expected CO_2 content is immediately reported to the garage concerned together with a diagnosis of the likely defect. The results are reviewed at four-weekly intervals so that any adverse trend can be quickly brought to notice.

Consideration has been given on various occasions to the possibility of using a direct-reading instrument in place of the modified Orsat apparatus. Such instruments depend upon the thermal conductivity of carbon dioxide in influencing the rate of cooling of an electrically heated wire. Variations in the carbon dioxide content of the atmosphere surrounding the wire lead to an apparent change in its resistance and by use of a Wheatstone bridge arrangement the resulting ammeter readings can be related to the concentration of CO_2 in the gases.

Unfortunately the readings so obtained are affected by the presence in the exhaust gases of constituents other than CO_2, thus leading to ambiguity in the interpretation of the result. Moreover, no information is provided regarding the amount of carbon monoxide present, a matter which is of considerable importance when analysing exhaust gases from petrol engines. It might be thought that these difficulties would not normally arise with exhaust gas samples from diesel engines, where the predominant constituent (apart from nitrogen, which can be neglected) is carbon dioxide. Experience has shown, however, that even in this application direct-reading instruments yield results that are quite unreliable. It has been suggested that the discrepancy may be due to the presence of a small and variable amount of hydrogen in the diesel engine exhaust emission.

Diesel Engine Combustion Control

It has already been mentioned that the diesel engine operates at maximum efficiency when utilising a mixture containing a large excess of air. Admittedly, some increase in power output can be obtained by increasing the proportion of fuel relative to air but at the expense of overloading the engine, greatly increasing its specific fuel consumption and leading to the production of continuous exhaust smoke due to incomplete combustion of the fuel. The engine manufacturer's rated output is such as to ensure both economy in fuel consumption and an acceptable clean exhaust emission. For any particular design of diesel engine there is therefore a recommended setting for the fuel-injection pump which should not be exceeded. In Great Britain, many operators of public service vehicles (including London Transport) prefer to set their fuel pumps so that the engines are derated by some 5 to 10 per cent. This procedure allows a tolerance for variations in adjustment of the pumps which may occur during the period between inspections; in addition it leads to an extension of engine life between overhauls.

Fuel Pump Settings

The first prerequisite for a clean exhaust emission is that the setting of the fuel injection pump should be below the smoke limit of the engine; appropriate steps must also be taken to ensure that this setting is maintained. The equipment employed for these purposes is the fuel pump testing machine—a commercial development by Leslie Hartridge, Limited, of a machine originally designed by London Transport's engineers—which is now in common use in Great Britain. The apparatus permits accurate balancing of the individual fuel-pump elements and measurement of their output under repeatable conditions, while the pump timing can also be set.

Although the amount of fuel injected into the engine cylinders and, therefore, the condition of the exhaust emission, is profoundly affected by the setting of the fuel-injection pump, efficiency of combustion is also influenced by the injectors fitted to the engine and the state of maintenance of the engine itself. Injectors are removed for cleaning and testing at intervals of 18,000 miles, though as a result of investigations which have been going on during the past four years, it is likely that this period can be considerably extended. Certain operators in Great Britain find that no attention is necessary within a period of running of 40,000 miles or even longer. The precise procedure employed for cleaning and testing of injectors at garages differs somewhat according to the design of the unit. As a generalisation, however, the injectors are partially or completely dismantled, carbon deposits on the needle being removed by means of a wire brush or metal polish according to condition and nozzle holes are cleaned using a special D-shaped needle. The injector units are then reassembled and subjected to a series of tests using an injector testing equipment which consists essentially of a hand pump connected with a calibrated pressure gauge, control valve and a supply of test fluid.

Fuel-injection pump testing machines at garages are tested and recalibrated at six-monthly intervals, it being essential that the machines should be in good agreement themselves and with those installed at the central overhaul works. This regular checking is carried out by staff attached to the research department and independent of the road services engineering department. To facilitate their work the inspectors are provided with single-cylinder fuel-injection pumps, each equipped with a reference injector which itself is tested against a master injector held at the central laboratory. The machines installed at the central overhaul works are tested and if necessary recalibrated at least once a day by works inspection staff. A six-cylinder master pump is used, the pump being tested at monthly intervals by the research department against its master injector, which is the ultimate standard. Injector testing machines are also checked at six-monthly intervals and in particular the pressure gauges are tested against a standard gauge. This gauge is referred to a master gauge held by the research department and calibrated against a dead-weight apparatus.

Smoke Emission

Maintenance procedures necessary to ensure that engines and fuel-injection equipment are kept up to the requisite standard are closely defined and cover the various items of work and inspection allocated to the garages and the central overhaul works respectively. References have already been made to the independent inspection undertaken by the research department's fuel economy staff. These inspectors are also responsible for observing the exhaust emission of buses on the road and for reporting any instances of smoking. While a small puff of smoke when accelerating from a stop may be difficult to avoid, any instance of excessive smoking is immediately notified to the garage concerned and the services of the inspectors are available if the defect cannot be quickly rectified.

At three-monthly intervals also the fuel economy inspectors, reinforced by an equal number from the engineering department, carry out an exhaust smoke survey in the busy area of London, some 800 buses being observed on each occasion. The condition of the fleet is thereby kept under a continuous review, thus ensuring that the various precautions laid down remain effective. Dense black smoke of the kind too often associated with the heavy-goods class of diesel-engined vehicle is usually due to deliberate interference with the setting of the fuel-injection pump in order to obtain an increase in engine power output; the same effect both in engine power and smoke density is produced through misuse of the cold-starting device, if this is of the type which can be operated from the driver's cab. Neither of these conditions is ever met with in London Transport nor with other responsible operators of public service vehicles in Great Britain. Nevertheless, exhaust smoke of a density sufficient to lead to public complaint is likely to be encountered if engines and fuel-injection equipment are not properly maintained.

It is notoriously difficult for an observer to assess exhaust smoke density—apart from grossly bad instances—in any quantitative manner. The appearance of the exhaust emission varies according to the weather and with the background against which it is viewed. London Transport's inspectors are provided with a set of five reference cards, ranging from a slight haze to black and originally produced by graded exposure and subsequent development and fixing of photographic plates. It has been found that individuals with long experience seldom need to make use of the cards, though they are of value for newcomers.

Exhaust Smoke Meters

During the past six months tests have been made with two designs of exhaust smoke meter. One of them, the Van Brand, of United States origin, provides an indication of smoke concentration by sucking a by-passed sample of the exhaust emission at constant rate through a strip of filter paper moving at a predetermined speed. Strip speeds of both 4 and 8 in. per min. have been used in our tests. The intensity of the resulting stain is proportional to the smoke concentration and can be measured either by comparison with a standard chart, such as the Bacharach oil burner smoke scale, or with an appropriate photoelectric reflection meter.

The other is a prototype commercial development by Leslie Hartridge, Limited, of a smoke meter designed by the British Petroleum Company. The meter measures smoke concentration by giving a direct reading of the percentage of light obscured by the smoke-laden gas passing through a tube of specified length. The light source is provided by an electric lamp positioned at one end of the smoke tube, light transmission being measured by means of a selenium cell at the opposite end of the tube. The instrument is calibrated by reference to a duplicate tube containing clean air, provision being made for both the light source and the selenium cell to be rapidly moved from one tube to the other by means of radius arms, one at each end of a common shaft passing through the interior of the instrument.

Both of these meters are of use in experimental work on bench-mounted engines and test vehicles, the Hartridge-B.P. instrument being the more generally convenient. Work is at present in progress in conjunction with a panel of the Motor Industry Research Association in an endeavour to devise a rapid technique for using this meter to measure the density of exhaust smoke emission from engines in service vehicles.

★

COMMER 6-TONNER ON TEST

(*Continued on page 13*)

for trunk operation, particularly of the future on the motorways, the two-speed axle, which is available with either gearbox, with a higher axle ratio (or an overdrive) might be considered desirable.

The low-speed pulling power was checked in the usual way by reducing speed in top gear to below 10 m.p.h. and then noting the response to full throttle and timing the acceleration from 10 m.p.h. to 20 and 30 m.p.h. respectively. The engine pulled away smoothly and willingly from these low speeds and the average times of 10.5 sec. to reach 20 m.p.h. and 24 sec. to reach 30 m.p.h. are well up to average for vehicles in this class.

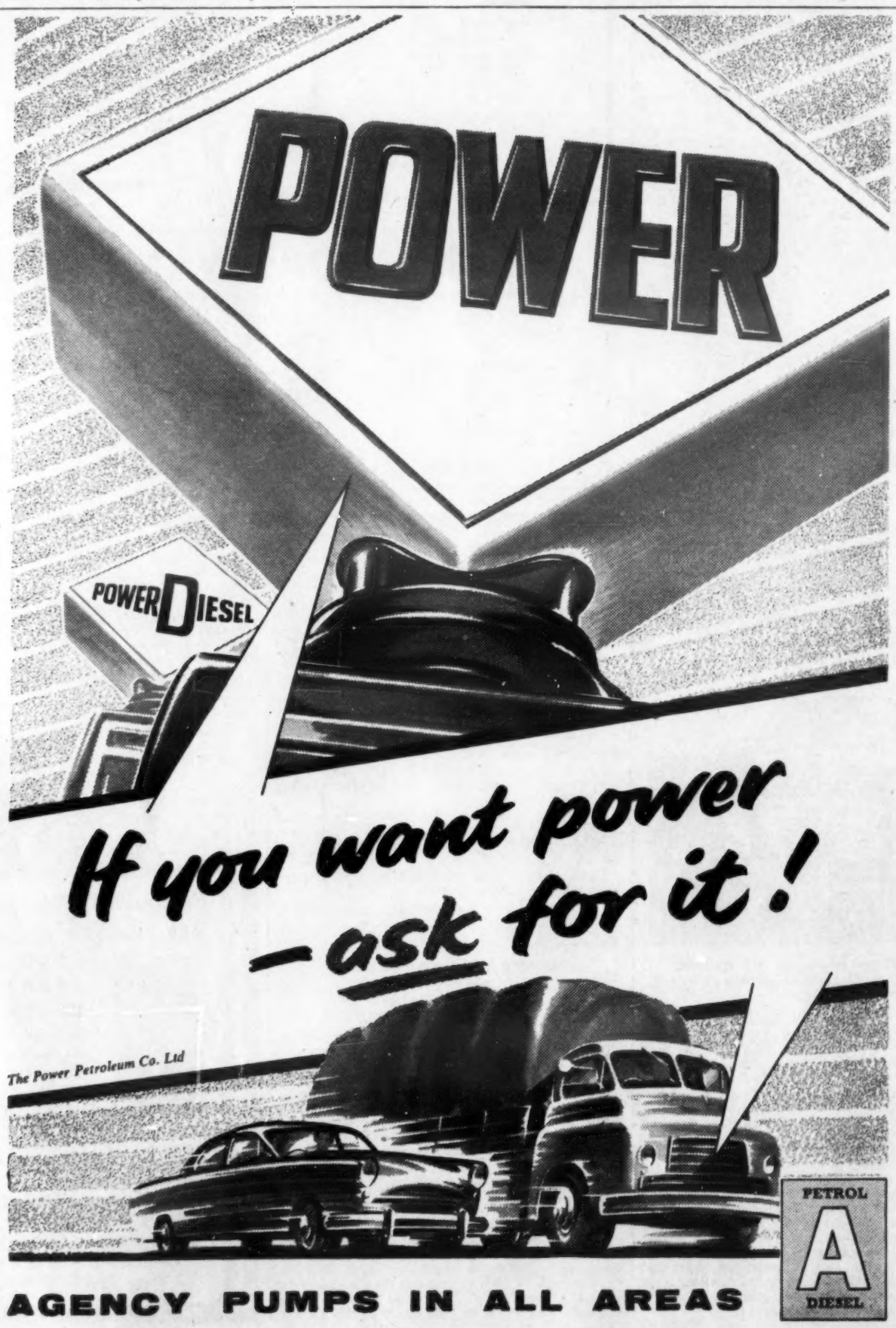
Similarly, on our observed sections formed by the gradients on Purley Way past the aerodrome and over Worms Heath the Commer did very well. On this type of hill, rather long but not very steep, there was no early falling off in power and speed was well maintained in the early less-steep sections of the hills. As the gradient stiffened, a change into third gear at about 18 m.p.h. quickly brought speed up to about 24 m.p.h. again. On Worms Heath, speed was allowed to fall to 13-14 m.p.h. before changing into third gear and recovery was equally good. An assault of Succombs Hill was not possible but there was little doubt in our minds of the Commer's ability to restart on its 1 in 4¼ section after a perfectly smooth and easy start was made on a 22 per cent gradient of another nearby unrestricted road. Gearchanging on the hills proved easy and perhaps faster between first and second gears than is the case with some synchromesh mechanisms, though movement of clutch and gear lever needed to be well synchronised to get a perfectly clean straight-through change due to the sliding mesh engagement of these gears.

Braking and Fuel Consumption

A stout and sensible handbrake lever held the loaded vehicle comfortably on a 1 in 4¼ gradient and when used alone at speeds of about 20 m.p.h. produced readings on the Don brakemeter of 38 to 40 per cent. Full braking through the pedal, with its Hydrovac servo and a laden specific lining area of about 47 sq. in. per ton, was progressive in action and powerful enough with fairly heavy pressure to lock the wheels on the damp roads encountered during most of the run. With the chalk-firing magazine connected, the average measured distance to stop from 30 m.p.h. in a series of simulated emergency stops was just over 51 ft., the best stop being just under 50 ft. There was even marking from all tyres on good open-textured tarmac made rather moist by fog.

Exceptionally good resistance to fade was revealed in our usual coasting run down Titsey Hill and an emergency application near the foot of the hill after the brakes had been well heated produced a reading on the Don meter of 52 per cent. Good ventilation of the drums was evident when, after a cooling-off run of about a mile, a brake application from 30 m.p.h. gave a normal meter reading of 68 per cent and locked all the wheels.

Fuel consumption was as usual checked in two ways; in a continuous-running out and back run over the 7¾-mile undulating country road between Limpsfield Common and Riverhead using a graduated test tank and by filling the main tank at the beginning and end of the day's work. Our standard 15-mile route carried an average amount of traffic and there was fair use of the gearbox due to the gradients on the route and checks in the villages and one complete traffic stop. The result obtained of 16.63 m.p.g. at an average speed of 29 m.p.h. is a fair indication of what is likely in all fully laden service in fairly confined conditions. In trunk operations over long open roads and where there is some empty or partly loaded running, results better by several m.p.g. could reasonably be anticipated. Overall fuel consumption of 13.5 m.p.g. was for a hard day's work totalling 137 miles. This included about 30 miles in London suburban traffic and a great deal of full-throttle and low-gear work in the various tests. It gives a fair representation of about the worst result likely from a vehicle used exclusively in all fully laden frequent-stop service in confined traffic conditions.



SOCIAL AND PERSONAL

Changes in Board of B.O.A.C.

THE Minister of Transport has appointed Sir Wilfred Neden, C.B., C.B.E., and Mr. Frank Taylor as additional members of the board of the British Overseas Airways Corporation. Sir Francis Brake will relinquish his appointment on the main board of B.O.A.C. at the end of the year in order to be able to concentrate on the affairs of B.O.A.C. Associated Companies, Limited, on whose board he will continue to serve. The Minister will then appoint to the board of the corporation itself Mr. Keith Granville, C.B.E., the deputy managing director. Sir Wilfred Neden has recently retired from the post of Chief Industrial Commissioner at the Ministry of Labour; Mr. Frank Taylor is chairman and managing director of Taylor Woodrow Construction, Limited, the civil engineering contractors.

* * *

We regret to record the death, at the age of 76, of Mr. Guy Bown, O.B.E., M.Inst.T., chairman of the United Transport Co., Limited. He was one of the pioneers of road passenger transport in South Wales and a founder director of Red and White

The late Mr. Guy Bown

Services, Limited, of which United Transport became the parent holding company, and he was joint managing director of United Transport (formerly Red and White United Transport, Limited), from its inception in 1937. He was also a director of a number of other companies, including Duramin Engineering Co., Limited, and Lydney Coachworks, Limited, and was chairman of Lydney Industrial Holdings, Limited. The principal Red and White bus interests were disposed of to the British Transport Commission under an agreement of February, 1950; they included the parent Red and White, United Welsh Services, Cheltenham District Traction, Newbury and District Motor Services, Venture, and South Midland Motor Services undertakings, as well as the fleets controlled by Griffin-Ralph. United Transport (as it then became) has a direct controlling interest in the African Transport Co., Limited, and in conjunction with that company, a controlling interest in Rhodesia United Transport, Limited. It also controls Bulwark Transport, Limited, Keith and Boyle (London), Limited, Guernsey Railway Co., Limited, and Guernsey Motors, Limited. The two last-named are bus undertakings. Mr. Bown was High Sheriff of Breconshire in 1952.

* * *

Staff at Euston Station are to sing carols in the Great Hall on December 23, between 6 p.m. and 7 p.m. Part of the programme is to be broadcast by the B.B.C. A collection will be made from passengers for toys for children's hospitals in London.

* * *

Mr. H. E. R. Bastin, M.Inst.T., appointed district traffic superintendent, Bristol, Western Region, B.R., entered the service of the Great Western Railway in the chief goods manager's office at Paddington and after experience in a number of departments at headquarters, was placed in charge of the freight train working section in 1941. He transferred to Bristol as assistant goods agent in 1945 and 15 months later returned to Paddington as assistant goods superintendent; in 1948 he was appointed goods agent at South Lambeth. Two years later Mr. Bastin transferred to the Eastern Region at Liverpool Street as goods and parcels terminals assistant to the chief commercial manager. In 1954 he returned to the Western Region as district commercial manager, Cardiff, and was appointed to the post of district commercial manager at Bristol in March last year. Mr. Bastin represents the B.T.C. on the South Western Area Transport Users' Consultative Committee, South Western Regional Board for Industry and the council of the Bristol Chamber of Commerce and Shipping. He is also a director of the Bristol Omnibus Co., Limited, its subsidiaries, and the Cheltenham District Traction Company.

Mr. H. E. R. Bastin

* * *

We regret to record the death of Mr. H. B. Fielding, managing director of Atkinson Vehicles, Limited, from 1933 until his retirement in 1950.

* * *

The Goodyear Tyre and Rubber Co. (Great Britain), Limited, has appointed Mr. M. M. Timmins manager of the tyre mileage division

* * *

Steels Engineering Products, Limited, has appointed Mr. W. D. Cartwright as field sales executive, located in London. Mr. Cartwright was formerly with R. A. Lister and Co., Limited.

* * *

The Goodyear Tyre and Rubber Co (Great Britain), Limited, has created a new sales division to be termed general products division, which will incorporate industrial rubber products. Mr. K. H. Johnston, A.M.I.P.E., becomes sales manager of the new division. It will handle items such as fendering for docksides and for working boats such as tugs, launches and smaller craft; also fenders for commercial vehicles and vehicle loading bays.

The Late Sir Jackson Millar

WE deeply regret to record the death of Sir Jackson Millar, C.B.E., D.L., J.P., who was chairman of Albion Motors, Limited, and a director of Leyland Motors, Limited, Scammell Lorries, Limited, and Scottish Aviation, Limited. Sir Jackson, who was 70, was educated at Ayr Academy, and after an apprenticeship in engineering completed his training with Halley Motors, Limited, of which his father was chairman. He was on the staff at Army Headquarters in France in 1918-19 and attained the rank of major. He became commercial manager of Halley Motors and in 1925 founded the business of Jackson Millar and Company, steam and combustion engineers, Glasgow. He was co-opted to the board of Albion in 1946 and was elected to the chairmanship of the company in August of that year. During the 1939-45 war he was Regional Controller in Scotland for the Ministry of Supply, and later also for the Ministry of Aircraft Production and for the Ministry of Production; for these services he was awarded the C.B.E. in 1943. He was knighted in the New Year's Honours List of 1957.

* * *

The English Steel Corporation, Limited, announces that Mr. W. E. A. Redfearn has been appointed a director.

The High Commissioner for Ghana, His Excellency Mr. E. O. Asafu-Adjaye, last week renamed London Midland Region Jubilee - class locomotive No. 45610 "Ghana"; hitherto it had carried the title "Gold Coast." Mr. David Blee, L.M.R. general manager, presided, and referred to the fact that on December 15 the last steam locomotive to be built at Crewe would appear

* * *

Lord Crook and Mr. J. C. Poole have been reappointed chairman and vice-chairman respectively of the National Dock Labour Board for 1959. Four employers' representatives and four workers' representatives have been nominated to serve as ordinary members on the board for the same period.

They are Messrs. J. Morris Gifford (general manager and secretary, National Association of Port Employers); R. H. Hampson (managing director, Scruttons, Limited); D. F. Martin-Jenkins (director, Ellerman Lines, Limited); L. Miller; T. O'Leary (national secretary, docks group, Transport and General Workers' Union); B. Fry (docks group secretary, Transport and General Workers' Union); J. N. Lisle (National Union of General and Municipal Workers); and M. Byrne (Scottish Transport and General Workers' Union).

* * *

The first of 13 Leyland Atlantean 77-seat buses for Wallasey Corporation was officially handed over to the mayor, Alderman T. F. H. Wilson, last week by Mr. J. S. Lees, Leyland Motors home sales manager. The comfort, convenience and economy of the new vehicle was praised by various representatives and in supporting a vote of thanks to Leyland Motors and Metropolitan-Cammell-Weymann. Mr. W. R. Goodier, general manager of Wallasey Corporation Transport, said that with the 20 Atlanteans he was hoping eventually to have, he could dispense with six duplicate buses, saving the corporation about £5,000 a year.

* * *

Mr. N. S. Taylor, A.C.I.S., M.Inst.T., assistant (claims and salvage) to commercial officer, Western Region, has been appointed commercial officer in the divisional traffic manager's office at Bristol. He joined the former Great Western Railway at Plymouth in 1922. In 1942 he was seconded for outdoor duties in connection with terminal working, rolling stock and bonus matters. Two years later, with the formation of the postwar planning section, he became its chief clerk and was responsible for the development of zonal collection and delivery schemes. He was also chairman of the Great Western-Southern Railway working committees concerned with the co-ordination of freight facilities at Reading, Exeter and Salisbury. With the formation of the Railway Executive, Mr. Taylor was appointed assistant to the executive officer (special duties) and was engaged on the co-ordination of railway facilities (freight and parcels) in the London area. In 1953 he became a traffic costing officer attached to the British Transport Commission and in December, 1954, was appointed to the position he now vacates. In 1951 Mr. Taylor received an Institute of Transport B.T.C. award for a paper, "Some London Freight Problems." He has been a member of the council of the Institute of Transport and for two years occupied the chair of the Berks, Bucks and Oxon section.

Mr. N. S. Taylor

* * *

Mr. Clinton H. Kemp retires from his post as vice-president and European general manager of United States Lines in January, 1959.

* * *

During the year ended September 30, 1958, there was a net increase of 218 in total membership of the Institute of Transport, about the same as in 1956-57. Student elections were up by 71 (932 compared with 861). The Institute has been recognised for the purposes of section 16 of the Finance Act, 1958, and in certain circumstances, therefore, members' subscriptions will qualify for relief of income tax. Mr. D. L. Munby, M.A., on October 1 took up the appointment of reader in economics and organisation of transport at Nuffield College, Oxford, following the establishment by the Institute of a readership and research fellowships in transport at Oxford University in February this year.

"My word! you look comfortable..."

"Certainly I am, this cab is a beauty."

"That job's a bit hard on the wagon, isn't it?"

"This HERON comes through all right, it's designed for the job. A custom built truck you know, made from the right stuff."

"My PAX II's just turning a hundred thousand and feels good for another."

"She certainly looks easy to load and unload, that platform is well down below average."

"Oh yes, but then Dennis specialise in low loaders and they have a dozen different ways of getting the deck nearer the ground."

"Dennis certainly think about the driver and they're the truck for me!"

Dennis vehicles are used extensively by large and important concerns throughout Industry and Commerce.

Like all DENNIS vehicles, they are designed to fulfil all possible transport requirements.

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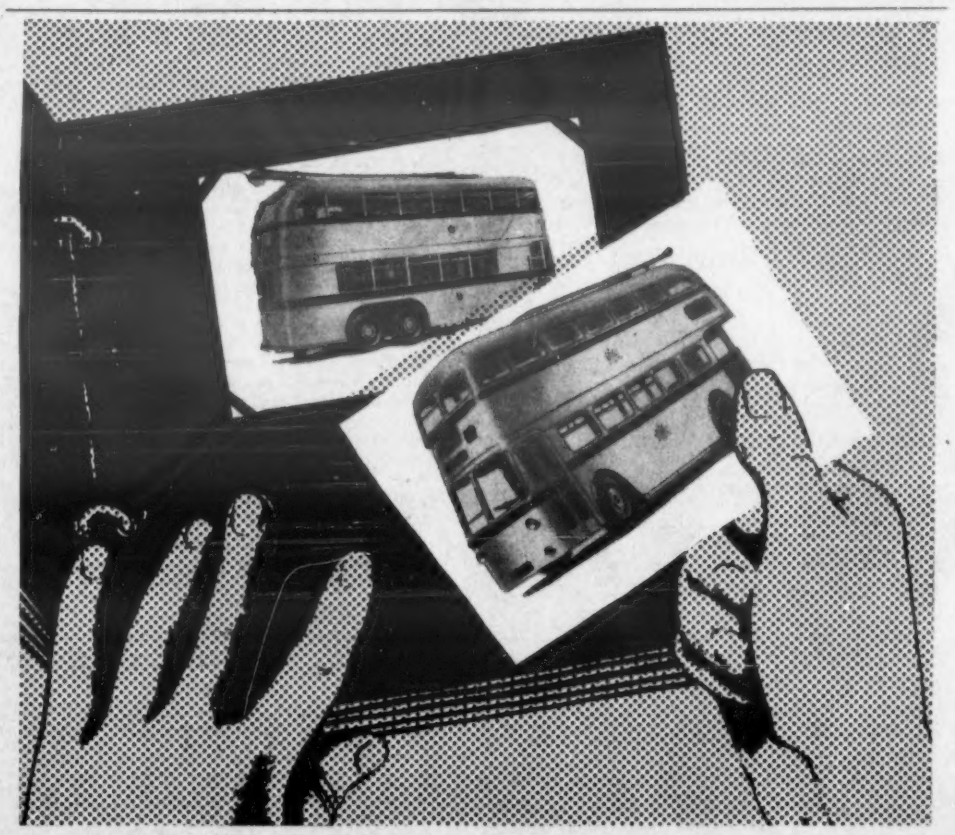

C.P. again for Bournemouth

Nine years ago we supplied the motors and control gear of twenty-four trolleybuses for the Bournemouth Corporation.

Last year the same Corporation ordered equipment from us for thirty new buses and this will be of our latest type with various features of advanced design.

At our Chelmsford Works we have been making electric traction equipment for something over sixty-five years. In the 1890's we supplied electric locomotives for the first underground system, the City and South London Railway, and have amassed a wealth of experience since then. Today we are still at the forefront of traction equipment design, and besides supplying equipment for trolleybuses and other road vehicles, we are equipping underground trains abroad, and some of the latest and most powerful diesel-electric locomotives for British Railways.

Crompton Parkinson LIMITED

MEMBER OF ATOMIC POWER CONSTRUCTIONS LTD.

One of the five British nuclear energy groups

TRACTION DIVISION, CHELMSFORD, ESSEX

TRACTION EQUIPMENT

TELEPHONE: CHELMSFORD 3161. TELEGRAMS AND CABLES: CROMPARK CHELMSFORD

IMPORTANT CONTRACTS

Boost for British Engines

NEGOTIATION lasting several months between the Canadian International Harvester and Rolls-Royce companies has resulted in an agreement under which Rolls-Royce diesel engines will be fitted to a new range of heavy-duty chassis to be built at International Harvester's Hamilton factory. The range includes seven different chassis and the Rolls-Royce engines will be manufactured in this country at the company's oil engine division works at Shrewsbury. Production is expected to begin early in 1959.

Japanese Locomotives for Egypt

The Japanese Hitachi company has received an order from the Egyptian railway system to supply 350 diesel locomotives to the concern, it was announced in Tokyo recently. The value of the contract is approximately 18½ million dollars.

Rolling Stock Manufacture in Spain

The Spanish Record tractor works, in Cordoba, is to open a plant for the manufacture of railway rolling stock. The plant will be operated by a newly formed company, Matafer S.A.I.C.i.F., in which the two Italian companies Fiat, of Turin, and O.M., of Milan, will participate jointly with Record.

North Eastern Region Contracts

Recent contracts placed by the North Eastern Region of British Railways include:

Metropolitan-Vickers Electrical Co., Limited, Manchester, for chain welding and normalising equipment at Darlington locomotive works.

A. Herbert, Limited, Newcastle, for a universal sheet metal shaper at Darlington locomotive works.

Standard Telephones and Cables, Limited, London, for an automatic teleprinter exchange at York headquarters offices.

Kitchen and Wade, Limited, Halifax, for one radial drilling machine at Stanningley district engineer's shop.

Cranes For King's Lynn Docks

The British Transport Commission has placed an order with Thomas Smith and Sons (Rodley), Limited, for six electric level-luffing portal cranes for use at Bentinck Dock, King's Lynn. The cranes will normally operate at a maximum load of 4 tons, but two of them will be capable of lifting single loads, such as containers or machinery, weighing up to 7½ tons. They will replace hydraulic cranes of lower capacity.

Marconi VOR for U.K. Network

Following an exhaustive evaluation of vhf omni-directional radio range (VOR) equipment, the Ministry of Supply has ordered 11 complete VOR installations from Marconi's Wireless Telegraph Company, on behalf of the Ministry of Transport and Civil Aviation. These installations will be distributed at selected points on United Kingdom airways to provide a nation-wide navigational system for suitably equipped aircraft.

Helicopters for Pipeline Project

Bristow Helicopters, Limited, Henstridge, Somerset, has placed an order with Westland Aircraft, Limited, for two Widgeon helicopters, which the former company is to operate under charter to the Iranian Oil Exploration and Producing Company in Iran. Bristow Helicopters already operates two Widgeons in the Persian Gulf area for British Petroleum and two Westland Whirlwinds owned by Shell.

Automatic Welding Gantries

Recent orders received by Quasi-Arc, Limited, Bilston, will bring to a total of nine the number of automatic welding gantries installed in British shipyards. This type of gantry, which is self-contained and runs on rails and is capable of making fillet welds on both sides of bulkhead stiffeners simultaneously, was originally developed in close collaboration with Harland and Wolff, Limited, and the first machine installed in that company's Belfast yard has been supplemented by two more. Four gantries are in operation at the Wallsend-on-Tyne yard of Swan, Hunter and Wigham Richardson, Limited, and others have been ordered by Vickers-Armstrongs, Limited, Barrow-in-Furness, and by Joseph L. Thompson and Sons, Limited, Sunderland.

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TENDERS INVITED

THE following items are extracted from the Board of Trade Special Register Service of information. Inquiries should be addressed, quoting reference number where given, to the Export Services Branch, Board of Trade, Lacon House, Theobalds Road, London, W.C.1.

January 2—Ethiopia.—Imperial Highway Authority for 40 diesel-engined 5 cu. yd. (g.v.w. 25,000 lb. or over) DUMPING LORRIES complete. Tenders to the Imperial Highway Authority, P.O. Box 1770, Addis Ababa. (ESB/30076/58.)

January 6—India.—Neyveli Lignite Project for one 250-h.p. DIESEL LOCOMOTIVE. Tender documents, price 15s., from the Director-General, India Stores Dept., Government Building, Bromyard Avenue, London, W.3.

January 9—Union of South Africa.—South African Railways for 10 or up to 60 heavy-duty two-axle ROAD TRACTORS for hauling independent trailers (excluding tyres, tubes and batteries) and spare RUNNING UNITS. Photocopies of tender documents from Export Services Branch, B.o.T., price 28s. (ESB/29459/58.)

January 13—Ethiopia.—Imperial Highway Authority for four diesel-engined PLATFORM LORRIES for 29,000 lb. or more g.v.w. Tenders to the Imperial Highway Authority, P.O. Box 1770, Addis Ababa. (ESB/30211/58.)

Export Opportunity—Pakistan.—Willcox and Islam (Chittagong), Limited, Spencer's Building, Agrabad Road, Chittagong, is interested in obtaining United Kingdom agencies for railway ROLLING STOCK and COMPONENT PARTS thereof. (ESB/28481/58.)

Export Opportunity—Switzerland.—Stahl und Maschinenbau A.G. (Stamag), Horw, Lucerne, would like to represent United Kingdom manufacturers of road-building machinery such as TRACTORS, EXCAVATORS, small and large EARTHMOVING EQUIPMENT and mobile CRANES. (ESB/29815/58.)

SHIPPING and SHIPBUILDING

"Ile de France" Decision

SPECULATION about the future of the C.G.T. liner *Ile de France* (44,000 tons), now 30 years old, has been ended by an announcement by her owners this week that she is to be withdrawn from service and will probably be offered for scrapping. The new 55,000-ton liner *France*, due to enter service in 1961, will, it is estimated, be able to carry more passengers in a year than the *Ile de France* and the *Liberté* together, due to her superior speed.

Eire to Expand Merchant Fleet

PLANS have been laid by Irish Shipping, Limited, to expand its fleet. A decision on the number of new ships to be built will be taken when the Government has passed legislation enabling further State finance to be advanced towards the company's development programme. Irish Shipping at present has 20 vessels, including an 18,000-ton tanker, due for delivery next year. The new ships to be built will include replacements for older vessels of the fleet, and a spokesman said that they would probably be of the 10,000-ton dry cargo type with a speed of 14 knots.

Cars on Irish Mail Boats?

THE possibility that mail boats between Holyhead and Dun Laoghaire may soon be used to carry passenger-accompanied cars in unused cargo space is being studied by the Eire Government and in shipping circles. Establishment of a car ferry service has been considered, but the shipping companies have been deterred by the cost. To be economic, it is thought, a car ferry would need to carry between 35,000 and 50,000 vehicles a year. The number of cars brought in last year was 6,865, and this represented almost a complete utilisation of the available space during the summer peak.

Report on Panlibhon Boycott

VERY successful is the description given by the International Transport Workers' Federation to the four-day boycott of Panlibhon shipping by I.T.F. maritime affiliates and other unions on December 1-4. Something like 200 vessels in ports throughout every continent had been directly hit by the boycott action, it was claimed, and a number of other Panlibhon ships sailed at reduced speeds in order to avoid entering port and being immobilised. The biggest "bag" was in the United States where over 140 ships were behind picket lines established jointly by seamen, longshoremen, tugboat crews and teamsters. Denmark commenced her boycott on December 12 in order that proper legal notice should be given.

Crankcase Oil Mist Detectors

IN notice to shipowners and shipbuilders No. M.424, the Ministry of Transport refers to photoelectric automatic devices which have been developed whereby excessive oil mist generation in the crankcases of large marine diesel engines may be detected so that suitable precautions can be taken to avoid risk of explosion. Two such devices, made by the Walter Kidde Co., Limited, and the Graviner Manufacturing Co., Limited, respectively, have been tested and approved by the Ministry for installation in both cargo and passenger ships. The department recommends the installation of these devices in new passenger ships and has decided that where they are so installed a 50 per cent reduction in the area normally required for crankcase relief valves will be accepted.

Waterway Container Service to Continent

CONTAINER service direct to the Continent at inclusive rates for traders and industrialists in the West Riding, South Yorkshire and East and West Midlands areas is being introduced by the North Eastern Division of British Waterways. Containers will be taken to users' premises in this country for loading, then by road to the nearest waterways depot for transport by barge to ships' sides at the Humber ports of Hull or Goole. These ports have linking services with Gothenburg, Karlstadt, Bergen, Oslo, Copenhagen, Amsterdam, Rotterdam, Hamburg and Antwerp, from all of which the containers will be delivered by road. The specially designed containers of reinforced plastics for this door-to-door service to the Continent measure 7 ft. 6 in. by 6 ft. 6 in., with a capacity of 270 cu. ft., which enables them to carry up to four tons of cargo.

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FINANCIAL RESULT

NOTES on the trading results, dividends and financial provisions of companies associated with the transport industry are contained in this feature, together with details of share issues, acquisitions and company formations or reorganisations.

Guy Motors

Its new range of commercial and passenger vehicles, incorporating revolutionary design features will do much to help Guy Motors, Limited, to recover from a loss of £173,000 during 1957-58, says the chairman, Mr. Arthur L. Blower. No dividend is recommended. Three main causes for the loss were, he says, the severe drop in the revenues of passenger transport undertakings in Britain which reduced the demand for buses; the cancellation of a Government contract as a result of the new defence policy; and unsatisfactory trading conditions in the Union of South Africa, where there is a Guy subsidiary. The Sunbeam Trolleybus Co., Limited, had a satisfactory year. The group loss of £173,760 contrasted with a profit of £62,149 in the previous year.

B.T.C. TRAFFIC RECEIPTS: PERIOD NO. 12—1958

	Four weeks to November 30, 1958			Aggregate for 48 weeks		
	1958	1957	+ or —	1958	1957	+ or —
	(£ thousands)			(£ thousands)		
PASSENGERS						
British Railways	8,491	8,373	+ 118	127,931	129,027	— 1,096
London Transport Railways	1,845	1,812	+ 33	22,409	21,322	+ 87
London Transport Road Services	4,197	4,524	— 327	44,484	54,853	+ 10,369
Provincial and Scottish Buses	4,147	4,157	— 10	55,619	53,404	+ 2,215
Ships	179	181	— 2	6,608	6,577	+ 31
Total Passengers	18,859	19,047	— 88	257,051	265,183	— 8,132
FREIGHT, PARCELS AND MAILS						
British Railways						
Merchandise and livestock	7,554	8,604	— 1,050	85,707	99,919	— 14,212
Minerals	3,696	4,443	— 747	41,606	49,454	— 7,748
Coal and coke	9,359	11,203	— 1,844	112,384	117,676	— 5,292
Parcels, etc., by passenger train	4,095	4,205	— 110	47,990	47,317	+ 673
Collection and delivery, etc.	1,020	1,029	— 9	11,441	12,392	— 951
Total Freight British Railways	25,724	29,484	— 3,760	299,128	326,758	— 27,630
Others	4,343	4,496	— 153	50,587	51,391	— 804
Total Freight, Parcels and Mails	30,067	33,980	— 3,913	349,715	378,149	— 28,434
Aggregate	48,926	53,027	— 4,101	606,766	643,332	— 36,566

Comparisons are affected by increases in rates which have been authorised from time to time, by the provincial and Scottish bus strike from July 20 to 28, 1957, by the London Transport road services strike from May 5 to June 20, 1958, and by the restrictions in oil supplies which operated from November 7, 1956, to May 14, 1957

TWO LAKH
(200,000 to you)
MILES UNFINISHED..
and still going strong

Mr. S. Gurdial Singh is on the right. The 'Comet' bus is modestly in the background.

Leyland 'Comet' buses are usually earmarked for overseas, and a reminder of the stalwart work they do comes from the Patiala Bus Service (Private) Ltd., who write :—

"This 'Comet' bus has been handled by S. Gurdial Singh through out and he has created a record of covering two lakh miles, and its engine has not been cleaned so far."

So far, so good . . . but according to Leyland calculations, it's good for another lakh or two yet before any attention is needed. The letter goes on :—

"This S. Gurdial Singh is a Driver with the District fame. He has been readering (sic) *meritorious services for the transport and has specially selected the Leyland for creating a good record which he has done definitely."*

He couldn't have chosen better! The letter ends on a gratifying note :—

"His maintenance and driving has created a charm and affection for Leyland among the transport operators in Punjab."

Thank you, Mr. S. Gurdial Singh

Leyland NEVER STOPS BREAKING ECONOMY RECORDS

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SALISBURY gears are smooth, silent and longer-lasting because of their exceptionally good finish. Careful quantity-production on the most modern machines ensures excellent quality in every way, less servicing, a really competitive price, and *delivery on time!* That's why Salisbury gears are specified for cars such as Jaguar and Aston Martin, for the new diesel locomotives, for the tough work of building and agricultural machinery.

SALISBURY make most kinds of gears, axle shafts and transmissions for industry and commerce. And Salisbury technicians are always glad to co-operate on new projects and problems. Perhaps they can help you too? Please write for further details.

HYPOID AND SPIRAL BEVEL GEARS UP TO 24" dia.

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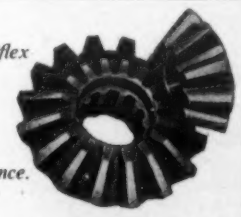

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